NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

♦ VOLUME 11, NUMBER 17 ♦ APRIL 25, 1994 PUBLICATION INTERNATIONAL DATA GROUP

IBM sculpting AS/400 along new server lines

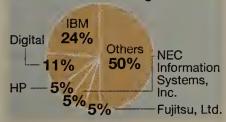
BY MICHAEL COONEY

IBM next week will offer up a slew of new Application System/400 capabilities that include integrated TCP/IP and SNMP support, enhanced multiprotocol networking and LAN integration features - all part of its plan to position the mid-range machine as the server of choice for the enterprise gen-

In announcements scheduled for NetWorld + Interop 94 here, IBM will also improve the AS/400's database offerings and make clear how the minicomputer will embrace Reduced Instruction Set Computing (RISC) technology and Unix applications. Some of the announcements make good on promises IBM made last summer (NW, July 5, 1993, page 1).

See AS/400, page 67





IBM next week will announce AS/400 enhancements it hopes will drive sales back up to levels from past years and balls it maintain its mortest lead. help it maintain its market lead.

> SOURCE: INTERNATIONAL DATA CORP. FRAMINGHAM, MASS GRAPHIC BY SUSAN SLATER

UB going after ATM pioneers with low-cost switch, cards

BY SKIP MACASKILL

3Com set to

deliver SuperStack

architecture for hubs,

routers and switches.

Ungermann-Bass, Inc. next week is expected to announce details of its Asynchronous Transfer Mode

(ATM) strategy, including plans for a workgroup switch and adapter cards that are "priced to move," according to sources close to the company.

UB's ATM AnyWhere strategy "is designed to disseminate ATM out to the backbone and down to the desktop [through] prices that will fuel early

adoption," said one source briefed on the plan. "The functionality will be integrated into existing UB gear, as well, to protect the installed base."

The strategy will be outlined at the NetWorld +

UB, which struggled financially in 1993, has recently regained some momentum, posting its first profitable quarter in almost a year. The ATM announcement may help it build on its newfound strength, according to analysts. INSIDE

The firm declined to comment on the upcoming announcement, the centerpiece of which will be a 16-port ATM switch, dubbed Wizard, that supports 155M bit/sec fiber connections. A modular version will be integrated into UB's Access/ One intelligent hub.

"This is a good first step for UB to take back its mantle of being a technology leader," explained Jack See UB switch, page 67

Cyber-sellers face security issues

Second in a series of occasional articles about doing business on the Internet.

BY ADAM GAFFIN

Internet users may one day tell friends they only connect to *Playboy* to download the arti-

Chicago-based Playboy Enterprises, Inc. is exploring ways to sell products, including digital reproductions of its photographs, via the Internet. The company claims that a high percentage of Internet users match the profile of its target audience, which it describes as well-educated males. And company officials, including founder Hugh Hefner, are impressed with the feedback from readers in Usenet and Bitnet conferences devoted to the magazine.

But security is a major concern in building an online Playboy store, said Tom Ryan, information resources specialist for the company.

Playboy wants to keep intruders from using the Internet as a gateway to its internal net. As an on-line vendor, it also has to ensure the integrity of transactions; buyers need to know, for example, that their credit card numbers will not be distributed around the world. And it wants to ensure that only the

people who pay for images get them, Ryan said. Playboy is not alone in its worries about doing business on-line. "Any client/server system with the See Security, page 67

West Haven, Conn. Preferred Systems, Inc. (PSI) this week will add to its family of NetWare management products a Windows-

NetWare users get audited

Preferred Systems offers much-needed report tool.

based tool that can query servers throughout the enterprise for data on usage and user access rights.

BY CARYN GILLOLLY

The firm's AuditWare product lets users collect and manipulate audit data as well as generate reports that can help maintain security and control costs.

"The market is dying for something like this," said Jack Karp, president of Affinity Research Corp., a consulting firm in Greenwich, Conn. "Everything else out there is a one-server product. If you have 100 or more servers in geographically distinct locations, that's not going to cut it."

Users agreed.

"AuditWare works within the [Net-Ware | 4.0 concept of enterprisewide See NetWare, page 66

Cheyenne's backup plan

Chevenne's ARCserve has come under fire from some customers, but our lab tests revealed a well-equipped LAN backup application.



See review, page 45.

Bank breaks the database rules

BY DAVID ROHDE

Quincy, Mass.

A Boston bank has licked one of the financial industry's most persistent technology problems: giving money managers real-time access to data on securities being held by the bank.

State Street Bank & Trust Co. has made its transaction processing database continuously available over a router-based internet to money managers equipped with SQL database tools. Those managers control more than \$1 trillion in mutual fund, pension fund and corporate treasury assets - securities that State Street holds in safekeeping on their behalf.

Money managers can initiate inquiries from desktop database and spreadsheet programs to get up-tothe-minute investment status reports.

The bank has also built in database triggers that can alert fund employees — particularly the actual

David Sexton is helping money managers get See Bank, page 66 up-to-the-minute data from State Street Bank.

NEWSPAPER

Briefs

Novell, Xerox in the middle. Xerox Corp. and Novell, Inc. are jointly developing a middleware product that will provide cross-platform connectivity for document management applications, according to indus-

Initially, sources said, the product will run on NetWare servers, incorporate many of the back-end document management services from Xerox's Visual Recall three-dimensional graphical document software and will use Visual Recall as a client front end.

Application program interfaces will be available so third-party developers can make their document management products compatible with the

Neither Novell nor Xerox officials would comment.

Filtering Notes. Tired of getting deluged with information when remotely accessing Lotus Development Corp.'s Notes groupware system? Well, Lotus is about to make life easier on you by providing a graphical way to create filters for messages in Notes conferences. Creating filters now requires extensive use of Notes macros. No shipment date or price was released.

On the air. Network application developers can now really make data fly. Pacific Communications Sciences, Inc. last week said it is shipping a \$995 software developers' kit for building applications to run on the Cellular Digital Packet Data (CDPD) network. The wireless application developers' tool reportedly allows programmers to simulate an end-to-end CDPD network on a personal computer platform without using the cellular airlink.

PCSI: (619) 535-9500.

Getting to the point-to-point. For those of you attending next week's NetWorld + Interop 94 conference in Las Vegas, don't be surprised if one of the "new" technologies being showcased is Integrated Services Digital Network. Advanced Computer Communications, Ascend Communications, Inc., Cisco Systems, Inc. and the DigiBoard division of Digi International, Inc. will partake in a demonstration of the Point-to-Point Proto col for interoperability of local-area network equipment over ISDN.

Hashing it out. The National Institute of Standards and Technology (NIST) last week issued a notice stating that the Secure Hash Standard detailed in the government's Federal Information Processing Standard 180 (FIPS 180) is "flawed" and will be rewritten. NIST said researchers at the National Security Agency, which developed the mathematical formula that allows users to check the content of documents sent over a network for integrity, discovered the flaw that makes the standard "less secure than thought." According to NIST, current products based on FIPS 180 can continue to be used until the technical correction is released.

Dear Bill Gates. Despite his rise to the top of the computer industry, Microsoft Corp. Chairman Bill Gates last week said he hasn't gotten too big to stop reading his own electronic mail, although now it may take four to five days for him to respond to nonurgent messages. Speaking at the Electronic Messaging Association conference in Anaheim, Calif., Gates said he has received thousands of messages since The New Yorker printed his E-mail address in January. Pile it on: his address is billg@microsoft.com.

Mail bonding. The first meeting of the Microsoft Corp.-backed Messaging Management Council started off with two hours of heated debate on whether the group was even needed. But eventually, representatives from Lotus Development Corp., Novell, Inc. and other firms agreed that standards for managing electronic mail networks are a good thing and said they would seek to merge the council's work with that of a similar EMA work

Contacts

ADDRESS: Network World, 161 Worcester Rd., Framingham, MA 01701. PHONE: (508) 875-6400; FAX: (508) 820-3467; INTERNET: network@world.std.com.; BBS: Interact with other readers: download free software, submit letters to the editor, leave news tips, change of address requests or hunt for jobs by using your IBM, Apple or other computer to dial into the BBS at speeds up to 9.6K bit/sec by dialing (508) 620-1178 or (508) 620-1160. READER ADVOCACY FORCE (R.A.F.) HOTLINE: Contact us with story tips about pressing user issues, (800) 622-1108, Ext. 487; NETWORK HELP DESK: Contact Dana Thorat via any of the above means.

Table of Contents

NEWS

Microsoft sprints to try and win E-mail race, but competitors vow to keep pace. Page 4.

DMS specifications get the Electronic Mail Task Force's recommendations. Page 4.

Xerox unveils DocuSP,

middleware that enables print documents of any size to be available for printing anywhere in the world. Page 4.



LEGENT intros apps toois that will

let users manage distributed multivendor environments from a central site. Page 6.

Sprint will try to prove itself as a systems integrator with its new Managed Network Service. Page 6.

DOD and **GSA** join forces to purchase network services. Page 6.

3Com's SuperSever ready to take flight next week, giving users more configuration options when building campus backbone nets. Page 8.

Draft standards to be extended to wireless devices by project spun off last week by U.S. and European vendors and messaging groups. Page 8.

The govt. was listening but heard no protests since AT&T added frame relay services to the FTS 2000 telecom contract in February. Page 8.

Arcada's new Storage Exec will give network administrators the power to centrally manage data backup across nets using Windows NTAS. Page 65.

IBM, DEC each showed off enhanced X.400based software at show last week. Page 65.

AT&T is ready to reveal EMMI, a device that will allow users to see and hear others while running applications and sharing data. Page 65.

ENTERPRISE INTERNETS

Digital encourages users to adopt Polycenter NetView. Page 13.

Make Systems releases simulation system that promises to ease net reconfiguration. Page 13.

LOCAL NETWORKS

Novell puts NetWare 2 to rest and offers big discounts to users for a less costly migration. Page 21.

DMTF finalizes the DMI specification. *Page 21*.

GLOBAL SERVICES

Facsimilie transmission costs are running rampant as sloppy management causes firms to leak unnecessary funds. Page 31.

3M continues to grow its regional SMDS net but needs carriers to create the net it needs. Page 31.

CLIENT/SERVER APPLICATIONS

Value-added nets could soon face stiff competition from the Internet for EDI business. Page 35.

Shany plans to extend its Alert View application management product to support Notes. Page 35.

DEPARTMENTS

- Opinions/Letters. Page 40.
- Action Center. Page 52.
- Networking Marketplace. Page 58.
- Networking Careers. Page 63.

Next week

A special series on strategic network issues kicks off with an examination of what makes virtual LANs tick.

Network HELP desk

Network World tracks down answers to your questions regarding products, services, technologies or disputes with vendors. Please submit questions to Dana Thorat at (800) 622-1108, via fax at (508) 820-3467, via the Internet at djt@world.std.com or via CompuServeat 73244,2673.

What Novell, Inc. NetWare Loadable Modules (NLM) do I need to have loaded on our company's Net-Ware 3.11 and 4.0 servers to use packet burst mode for file transfer between two file servers over a brouter? Also, how do I monitor and customize the sliding window for packet transmission acknowledgements?

Ajay Busari, Bangkok, Thailand

Ronald Nutter, director of technical services at 900 Support, a 24-hour, seven-day-per-week Net-Ware technical support company in Lake Oswego,

NetWare's packet burst mode is an optional mode of transmitting data. Burst mode can significantly improve network performance because it

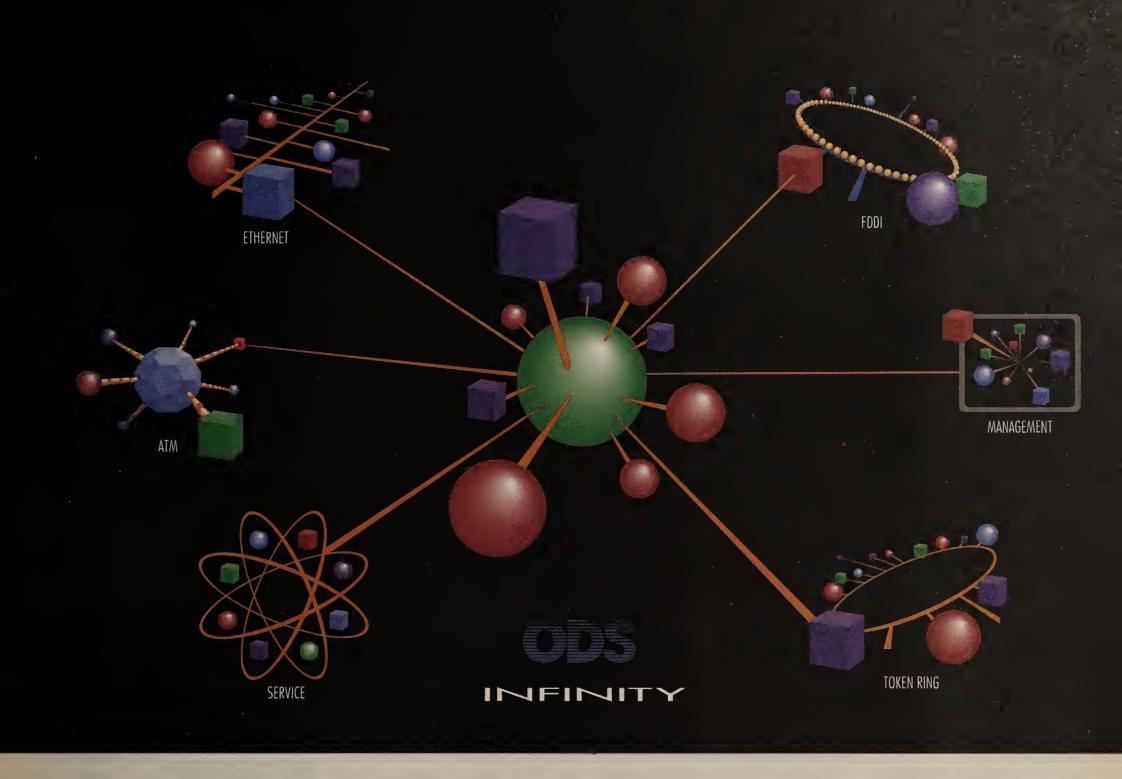
allows more data to be sent without waiting for receiver acknowledgments.

For burst mode to work on NetWare 3.11, you must install the files PBURST.NLM on the server and VLM.EXE on the workstations. PBURST is built in to NetWare 4.X and requires no additional NLMs. Note that Novell no longer distributes or supports BNETX.EXE, the enhanced version of NETX that supported packet burst.

You will also need to check with your brouter manufacturer to see if it supports packet burst mode. If you are using Novell's Multiprotocol Router, you should load LIPX.NLM on the server. LIPX supports the transmission of packet sizes as large as 1,024 bytes.

To monitor the sliding window for transmission acknowledgements, you will need a network management tool, such as Novell's NetWare Management Services or LANalyzer for Windows. For more information on these products, call Novellat (800) 638-9273 or (801) 429-5588.

As for customizing the sliding window, this information is not generally available since it is a core operating system function in newer releases See Help desk, page 51



A UNIVERSE OF NETWORKING SOLUTIONS WITH ODS INFINITY™ SWITCHING HUBS

The ODS Infinity family of switching hub products brings you a universe of networking solutions for Ethernet, Token Ring, FDDI and ATM networks. With features like per-port and work group switching the Infinity allows your organization's network to grow and

change along with your organization. Adds, moves and changes to network users are done in a matter of seconds with just a few keystrokes. Plus the ability to load balance network traffic maximizes network performance with a minimum of effort. Add to that ODS LanvisionTM network management software which supports HP OpenViewTM, SunNetTM Manager, IBM NetViewTM 6000 and Microsoft WindowsTM and you have exceptional network manageability in a full-featured switching hub. All this in a chassis designed with modular backplanes that will preserve your existing capital investment while giving you the power to move to the next generation of networking. And with the highest port density of any hub available



you'll actually need fewer hubs to run your network. If you're looking for a hub that really is the core of your network, call ODS at (214) 234-6400 today. We're not looking to steal all the attention with our new hub. We just want to be the center of it.



September 6, 1993



The Future Of Networking Today.

214.234.6400

Fed users back widespread adoption of DOD E-mail plan

BY ELLEN MESSMER

Washington, D.C.

A federal advisory group that recommends electronic mail policy last week said the government should adopt the Defense Message System (DMS) mail and directory specifications as a standard for agency business communications.

In its report, the 11-member Electronic Mail Task Force said the tough security and performance requirements the Department of Defense is demanding make DMS software the best choice for a civilian agency business E-mail standard.

Federal telecommunications managers stand ready to implement the report's find-

ings as part of Vice President Al Gore's "reinventing government" initiative. But critics charge that DMS is overkill and could force the private sector that does business with agencies to adopt a hardware-based technology imposed by the Defense Department.

The DMS procurement, expected to be awarded in December, is believed to be the single largest request for proposal ever issued for electronic mail. Nearly FLYSIK two million military users of DMS

software will eventually be equipped with Tessera PCMCIA crypto-cards for electronically signing DMS documents, checking document integrity, encrypting messages and handling logon authentication. The RFP is written to allow civilian agencies to buy off the DMS contract.

The DMS Tessera card, designed by the National Security Agency (NSA), operates

with a secret key-escrow technique that lets the government decrypt messages encrypted with the card. But Tessera's public-key technology, which forms the heart of DMS security, has to be implemented in a chipset so the key-escrow secrets are not revealed.

AT&T, Mykotronx, Inc. and National Semiconductor Corp. are known to be among the bidders for the first competitive contract for Tessera cards, which the NSA is expected to award this week.

DMS is a reasonably good technology, said John Yin, head of National Aeronautics

and Space Administration's electronic messaging group, which, like several other civilian agencies, is testing protoype Tessera cards. But Yin said more study needs to be done on whether civilian agencies require the level of security provided by Tessera cards. "Agencies may determine that software-based encryption is adequate in terms of risk vs. cost," he said.

DMS requires "very strict security that no business would use," added Thom McCann, product manager of the business systems division at Microsoft Corp. But many federal network managers disagree.

"For the moment, this would appear to be the right direction for the civil side of government when it needs business-level communications," said Mike Corrigan, assistant commissioner for telecommunications ser-



Getting the message out Percentage of users at select federal agencies

> vices at GSA and a member of the Electronic Mail Task Force.

Jim Flysik, director of telecommunications at the U.S. Department of the Treasury, agreed. "The DMS is further along on these issues than anyone else," added Flysik, who will lead a joint civilian/Defense Department committee to assure compatibility with civilian agency requirements.

There is no comparable messaging product available today for business E-mail that achieves the security and performance of DMS, according to Neil Stillman, deputy assistant secretary for information resources management at the Department of Health and Human Services and chairman of the Electronic Mail Task Force.

Bill Moroney, executive director of the Electronic Messaging Association, said it appears that the government is attempting to force DMS onto the private sector. Moroney said the Tessera cards' key-escrow system creates a new security problem since it gives government employees the ability to access user data by means of a government-held

messaging, but it will face stiff competition from several vendors with their own ideas for electronic mail systems based on client/server technology. Lotus Development Corp., Hewlett-Packard Co. and Novell, Inc. all vowed to match, and beat, Microsoft's vision of a universal E-mail client which can access a variety of information services through a messaging

BY ADAM GAFFIN

Even as Microsoft Chairman Bill Gates was telling 2,500 attendees at the Electronic Messaging '94 show about Microsoft's messaging strategy, Lotus was readying an announcement of a beefed-up cc:Mail router — the next step in its own client/server strategy.

Serving up a

messaging war

Microsoft Corp. hopes to score a touchdown in

HP, meanwhile, used the conference to announce enhancements to its OpenMail messaging server, while Novell demonstrated the beginnings of its Open Enterprise Messaging server.



news from EMA, see pages 8,

Gates used his keynote address to push Microsoft's "Information Exchange" strategy of linking end users to a range of information sources through a single

He demonstrated software called Explorer, to be bundled in future Windows clients, that will provide this interface, through which they can view and manipulate data from a range of sources, including mail systems, calendars, facsimiles and even voice

The universal client will be connected to a Windows NT server code-named Touchdown via Micro-

Information **Exchange** components

Explorer - A future Windows client component that gives end users a single in-box for viewing and manipulating data from a variety of sources.

Touchdown --- A Windows NT-based messaging server that has a variety of communications and management features

MAPI - Connects clients and servers; a tool for building mail-enabled applications.

and management features. Agreements nounced with two thirdparty vendors could help Microsoft grab a share of the enterprise messaging

soft's Messaging Applica-

tion Programming Inter-

faces. The server, in turn,

will feature native X.400 support as well as a vari-

ety of message routing

SoftSwitch, Inc. of Wayne, Pa., said it would integrate its Enterprise Message Exchange (EMX) X.400 mail switch with Touchdown. The companies will work to synchronize product directories as well as ensure interoperability between their respective implementations of X.400.

The move could give Microsoft a hook into heterogeneous networks because of EMX's ability to connect a variety of proprietary E-mail systems.

Collabra Software, Inc. of Mountain View, Calif., announced it would work with Microsoft to integrate its Collabra Share conferencing software with Touch-

Microsoft competitor Lotus is not standing still. Lotus officials said Notes already provides a universal in-box format. And last week they announced a revamped router for cc:Mail that lets managers create a variety of network and directory topologies and adds See War, page 66

Xerox offers print services middleware

BY KEVIN FOGARTY

Xerox Corp. last week unveiled middleware designed to let users more easily transport and print documents of any size to reduce storage and delivery costs.

Xerox's Document Services Platform (DocuSP), revealed at the Association for Integrated Image Management Conference and Exposition here, translates page description languages (PDL) and communication protocols to make documents available for printing anywhere in the world.

The company is supplying application program interfaces and developer tool kits to members of its New Document Alliance vendor partners that have pledged to make their communications, printing, document management and other products compatible with DocuSP. Partners include AT&T, Novell, Inc. and SynOptics Communications, Inc.

When fully implemented, the document superhighway, as Xerox is calling it, would let users print a document locally on demand, no matter where it is stored.

A college bookstore, for example, could eliminate much of the cost of transporting and storing books. It would order textbook files on remote databases to be downloaded to the school's own printshop, which would print and bind books as needed by the store.

'Today, you can pick up a telephone and reach anywhere," said Peter van Cuylenburg, executive vice president of operations for Xerox. "It should be the same with documents and publications."

DocuSP is designed to link network printers to a range of software and hardware products through local- and wide-area networks, including public networks such as the Internet. Based on the International Standards Organization's ISO 10175 print protocol, it translates documents stored in most formats into the print format required in a user's print shop.

A variety of PDLs are supported, including Adobe PostScript Level 2, Hewlett-Packard Co.'s HP PCL5, TIFF and CCITT Group IV files. DocuSP also supports NetWare, Transmission Control Protocol/Internet Protocol, ASCII, AppleTalk, and other network and print protocols, according to

Filling out the picture will be vendor partners that supply specialty book-binding machines, computing hardware, routers, telecommunications, storage media, imaging, consulting, integration, and other products and services.

Due for release during the fourth quarter, the \$53,000 DocuSP server version runs on Sun Microsystems, Inc. SPARCstation and Solaris 2.3. Client versions, which provide a front end to the server-based functions, run on Macintosh, Windows and Sun platforms.

"It's a fantastic change for the industry," said Patrick Burns, vice president of corporate services for Park Ridge Health Care System in Rochester, N.Y. The hospital and nursing-home company uses thousands of medical and insurance forms that it must print, store and transport.

Using the network storage and remote printing model Xerox is developing, Park Ridge could store the forms electronically, change them as needed and print just what it needs, Burns said.

The Xerox plan makes developing such a system easier because Xerox acts as integrator for specialized printing and connectivity vendors, said Fred Moore, printing management officer for the National Aeronautic and Space Administration, who was present at the announcement.

But NASA has doubts that DocuSP will ever be as open as Xerox says it will be. "I'll believe it when I see it," said Richard Tuey, section head of policy, planning and resources for NASA's Scientific and Technical Information Office. **Z**

"Interactive home video and movies on demand.
That's all I want."



"For now."

DOD and GSA to team on net procurements

BY ELLEN MESSMER

Washington, D.C.

The Department of Defense and the General Services Administration will combine forces to buy net-

Robert Woods, GSA administrator for Federal Telecommunications System (FTS) 2000, last week said the civilian and military sides of government will strive to combine the planned Defense Information System Network (DISN) with the broad range of services GSA anticipates government users will want following expiration of the current FTS 2000. That contract, held by AT&T and Sprint Corp., ends in 1998.

The government may issue one or several requests for proposal to support the combined traffic, the goal being to hold down costs and boost interagency cooperation through combined purchases.

"We want to combine our network requirements. At the next layer, we have to design the joint program,' Woods said.



The military has routine administrative traffic similar to agencies, Woods civilian pointed out. In turn, civilian agencies like the Federal Reserve System, the Federal Aviation Administration and others have security requirements not unlike the Defense Department, he added.

But analysts warn that a combined network may not

necessarily mean big savings for government — or a happy marriage between the defense and civilian branches

"I'm not convinced that aggregating traffic into one super-acquisition would achieve this," said Warren Suss, president of consultancy Warren Suss Associates in Jenkintwon, Pa. "There are limits to the types of economies you would receive. And you could actually drive up costs because you have requirements for certain segments of your users in defense that exceed the commercial side.'

The Defense Department is currently consolidating more than 180 existing long-line networks used by the Army, Navy and Air Force - including the huge Defense Commercial Telecommunications Network that will be provided by AT&T until 1996 — into a more

"The consolidated effort would form the foundation of a global information infrastructure," said Gen. Emmett Paige Jr., assistant secretary of defense for command, control, communications and intelligence.

DISN would provide the backbone for electronic mail for two million users of the upcoming Defense Message System now out for bid. DISN would also carry a huge volume of traffic from several data processing "megacenters" and from U.S. military bases around the world.

The decision to work with the civilian agencies represents a radical departure from the position the Defense Department took on FTS 2000 in 1988 when it flatly refused to switch even routine voice traffic to the contract, claiming that its military command-and-control requirements made FTS 2000 unsuitable for defense needs. Congress eventually forced the military to join FTS 2000, but only a small percentage of the military's commercial traffic is on FTS 2000.

The Defense Department's new attitude on cooperation with the civilian sector may be prompted by its rapidly shrinking budget, which makes building civilian alliances to share costs more appealing.

LEGENT delivers on distributed net and systems mgmt. promise

BY MICHAEL COONEY

Herndon, Va.

LEGENT Corp. last week rolled out a set of applications and related middleware tools designed to let users manage distributed multivendor environments from a central

The firm also expanded its marketing relationship with Hewlett-Packard Co. by announcing that the companies will resell each other's net and system management products.

Key to LEGENT's multivendor network and system strategy is the rollout of its first Cross Platform Environment (XPE) applications, a set of products adhering to the XPE distributed management application framework LEGENT announced last year. LEGENT also introduced XPErtware, middleware code incorporated into all XPE products that enables them to interoperate and that can also be used as a development tool by users.

LEGENT has issued its first 18 XPE applications as its Prevail/XP series. The software is designed to run on both the device being monitored or alongside the application being tracked, as well as on an XPE Management Station. The management station can run on IBM OS/2 or AIX, Sun Microsystems, Inc.'s SunOS, HP's HP-UX or Windows NT workstations.

Among the new application modules is Prevail/XP-Automation, which runs on MVS mainframes and tracks the operations of data center-based mainframe consoles.

The software can track messages, commands and system errors handled by the console and can automatically issue responses to those communications.

Prevail/XP-Automation Point provides the same function for Unix, Application System/400, Tandem Computers, Inc. or Digital Equipment Corp. hosts. Other Prevail/XP applications let users automate CICS or IMS transactions and distribute software across a local-area net.

Prevail/XP also supports existing LEGENT applications such as its Paramount network and systems management platform, which integrates LEGENT's previously standalone systems and network manage-

ment applications.

With the XPE framework in place, users will be able to monitor Unix-based servers, distribute software to Unix, Windows or OS/2based devices using any network protocol, keep track of their Systems Network Architecture hosts, and automatically initiate file transfers

all from a single workstation of their choosing, said John Burton, president and chief executive officer of LEGENT.

Tying the new Prevail/XP environment to existing enterprise management platforms is the Prevail/XP-Paradigm troubleticketing system. Paradigm runs on HP's OpenView, IBM's NetView/6000 and Sun-Connect's SunNet Manager platforms.

In expanding its relationship with HP,

LEGENT will now include HP's OperationsCenter problem and operations management application in the Prevail/XP family suite of products. Operations Center is a Simple Network Management Protocolbased application that monitors net performance and device status information from nodes on Transmission Control Protocol/Internet Protocol nets. HP will resell the Paradigm trouble-ticketing application as part of its OpenView package.

Existing LEGENT users were cautiously optimistic about the XPE framework.

"We need distributed management capabilities now, and what LEGENT is talking about doing will help us," said Dan Ward,

LEGENT buys in to XPE

Merges with Spectrum Concepts, Inc. and grabs the XCOM file-transfer program that is now used to transfer files to XPE applications.

Licenses Navigraph graphical user interface (GUI) from Landmark Systems Corp. that is now used on XPE Management Station.

Acquires Networx, Inc., developer of Paradigm trouble-ticketing application now known as XPE's Paradigm/XP.

Acquires Corporate Microsystems, Inc., provider of the MLink Unix technology that is now used to distribute software among Unix platforms running XPE applications.

Signs letter of intent to develop management products with HP.

manager of the command center at American Greetings in Cleveland. Ward said his firm just implemented five mission-critical distributed applications.

"We want to be able to manage our distributed LAN environments just like we did with mainframe-based networks," he said.

Prevail/XP components are available individually or in suites starting at \$5,000.

©LEGENT: (703) 708-3000.

Sprint to launch managed router-based internet service

BY DAVID ROHDE

Las Vegas

Sprint Corp. will try to prove its mettle as a systems integrator at next week's Net-World + Interop 94 show here with the announcement of an around-the-clock Managed Network Service.

Under the service, Sprint will design, install and manage router-based local-area

net internets that use its packetswitched, fast-packet or private-line services. The carrier will provide and configure routers from Cisco Systems, Inc. or Wellfleet Communications, Inc., and offer around-theclock network monitoring from a data center in Herndon, Va.

Other interexchange carriers and value-added network providers already offer similar services. For example, AT&T provides remote monitoring and network design services under its InterSpan Frame Relay Plus and Enhanced Connectivity Options (NW, April 12, 1993, page 1).

Sprint officials claim that the carrier is already managing 80 user networks that it designed and configured. The Managed Network Service will now be offered to all comers for \$200 to \$240 per router per month.

During the next year, the service is expected to expand to include the provisioning, configuration and monitoring of other data communications equipment such as Asynchronous Transfer Mode feeder switches and, perhaps, intelligent hubs.

vice, Sprint is assigning internetworking experts - including about a dozen special-

To support the Managed Network Ser-

Sprint's Managed Network Service

- Supports Cisco Models 2500, 4000 and 700, and Wellfleet Models AN, AFN, FN, LN, CN, BLN and BCN as router options.
- Supports IP, IPX, AppleTalk, OSI, DECnet, VINES and XNS protocols.
- Provides 24-hour router monitoring.
- Supports frame relay, X.25, private-line and SprintLink (a TCP/IP-based service) WAN
- Sprint is not responsible for problems isolated to a customer's LAN, such as workstations, applications and network operating systems.
- Costs \$200 to \$240 per router a month; volume discounts are available.

ists on Internet Protocol addressing — to a dedicated data center in Herndon. The carrier also is assigning program managers, each responsible for three to five Managed Network Service clients.

The carrier is aiming to have router nets installed within 45 days after a user signs off on the network design, said Bernie Schneider, director of product management for the Sprint Data Group in Kansas City, Mo.

Eclipse, Inc., a manufacturer of industrial burner systems in Rockford, Ill., started using the Managed Network Service when it brought up its Sprint frame relay network in January.

"If there's a problem, I get a call," said Ray Meyers, director of management information services. "Usually it's fixed before I even know about it. If I want to add a new facility, it's a totally painless experience."

Sprint officials expressed discomfort with the typical pace of net-disrupting router software upgrades, which would be limited to a year under the Sprint program.

"We can't afford to be getting a software release of the month, much less a release of the week," Schneider said.

From the central data site, known as the InterNetwork Service Center, Sprint will oversee customer networks from Hewlett-Packard OpenView workstations. The carrier is testing an option that would give users read-only access to the network manage-

Although the difficulty of managing LAN hubs has users requesting help there, Sprint for now will limit network management to the routers and transport.

"The highway is littered with too many people who tried to be end-to-end integrators," Schneider said.

©Sprint: (800) 877-4646.

Give people the broadband services they'll want next. Without making what you have now obsolete.

GLOBEVIEW-2000 BROADBAND SYSTEM THE EVOLVABLE ATM

FIND OUT MORE AT SUPERCOMM BOOTH #1141 AND NETWORLD+INTEROP BOOTH #2208

MORE THAN JUST EQUIPMENT WHAT YOU NEED TO COMPETE



Groups set to work on wireless X.400 standards

BY ADAM GAFFIN

Anaheim, Calif.

Draft standards for connecting remote users to X.400-based electronic mail systems will be extended to wireless devices under a project begun last week by U.S. and European vendors and messaging associa-

The goal is to allow wireless users to connect to their home office mail system regardless of the type of wireless device they use, said Mark Smith, a technology manager at Intel Corp.

Smith was one of several vendor representatives to attend a meeting on the issue at the Electronic Messaging Association (EMA) conference last week.

Officials from both the EMA and the European Electronic Mail Association said they would back the effort. It would build on work begun two years ago by the Asynchro-

nous Protocol Specifications Alliance, a group of 33 vendors including AT&T, Intel, Microsoft Corp. and several European telecommunications providers.

The International Telecommunication Union

Telecommunication Standardization Sector, an international standards body, is currently considering draft standards developed by the alliance for connecting remote users via dial-up modem links to X.400 message servers. If adopted, the specifications would be

Currently, the wireless messaging arena "is fantastically disorganized," when it comes to ways of connecting wireless devices to messaging servers, according to David Knight, vice president for marketing at Isocor, a Los Angeles X.400 vendor and alliance founder.

Wireless vendors have developed their own standards for connecting users to backend message servers, but the plethora of standards "is one of the problems," said Frode Hernes, senior systems architect at Maxware, a Norwegian X.400 vendor and alliance member.

"We're going to take a look at it," said Martin Levetin, senior vice president at RAM Mobile Data.

He added, however, that he has some concerns about the relatively large information overhead required to transfer X.400 messages. Z

3Com readies new stackable product strategy

BY SKIP MACASKILL

3Com Corp. next week will announce a network architecture based on stackable hubs, routers and switches that is designed to give users more configuration options when building campus backbone nets.

The company's new SuperStack architecture, which will be rolled out at the NetWorld + Interop 94 trade show here, involves bringing out stackable versions of the company's major product lines, allowing users to add functionality as and where needed in a cost-effective manner.

SuperStack will complement 3Com's High Performance Scalable Networking architecture, which enables users to build routed Asynchronous Transfer Mode collapsed backbones using high-end 3Com hubs, routers and switches.

'By offering not only hubs, but also routers and switches in a stackable form, 3Com will allow me to react more quickly to users' connectivity and interconnection needs, as well as resolve bandwidth congestion issues without investing in a high-end internetworking device," said one 3Com customer familiar with the plans. "This stereo component approach is perfect for my environment since it's in a contant state of flux."

3Com declined to comment on the rollout.

In the first phase of SuperStack, which will be completed by the end of June, 3Com will unveil new Ethernet and token-ring versions of its LinkBuilder Flexible Media Stack (FMS) hub line, and three stackable routers in its NetBuilder Remote Office family.

The new LinkBuilder FMS II is a fixed-port Ethernet hub that will come in 12- and 24-port versions. Enhancements over the existing LinkBuilder FMS will include support for a Simple Network Management Protocol-based module, a local bridging module and a module that combines both functions. The modules slide into an expansion slot on the FMS II.

The company will also introduce its first token-ring LinkBuilder — the FMS TR — which will come in 12and 24-port versions and accept copper and fiber ring-in/ring-out modules as well as an SNMP module.

Pricing for managed versions of the LinkBuilder FMS II will be as low as \$65 per port. Pricing was not available for the other products.

On the routing side, 3Com will offer a fixed-port boundary router, an access router and a full-featured router. Details on those devices were not available. While other vendors have announced intentions to integrate internetworking functions in their stackable

deliver with a June ship date.

In the second phase of SuperStack, scheduled for the third quarter, 3Com will unveil a redundant power system, making it one of the first companies to deliver this level of redundancy in a stackable line.

lines, 3Com will become one of the first to actually

3Com will offer a stackable version of the Link-Switch module that is currently available for its Link-Builder Multi Services Hub. A stackable Synchronous Data Link Control Converter device based on Sync Research technology will also be unveiled, along with a Remote Monitoring module for the FMS line.

The third phase of SuperStack will happen in the fourth quarter and include a 100M bit/sec Ethernet stackable hub and Integrated Services Digital Network features for the NetBuilder Remote Office line.

In order to manage this suite of new products, 3Com will announce Transcend Workgroup Manager for Windows, which will be able to manage hubs and adapter cards, and Transcend Enterprise Manager for Windows, which will be able to manage all components of an entire stack.

Govt. users face no frame relay hassles

BY JOANIE WEXLER

The official protest period since AT&T quietly added frame relay services to the federal government's Federal Telecommunications System (FTS) 2000 telecommunications contract in February has come and gone without a peep from would-be contenders.

Silence on the part of WilTel and MCI Communications Corp. after a history of protesting new FTS 2000 services on the grounds that they should be open to competitive bid — gives federal users the green light to purchase frame relay and other services equivalent to those that are commercially available.

FTS 2000 coproviders AT&T and Sprint Corp. have been facing opposition from WilTel and MCI, most notably on T-3 service, for years. But a federal court ruling last summer made a broad interpretation of what constitutes FTS 2000 service enhancements, which are allowed under the huge government contract.

That ruling allowed AT&T and Sprint to provide T-3 service under FTS 2000, a move that has apparently tempered rival carriers'

inclination to rush to court every time an FTS 2000 modification

The court's interpretation of what constitutes "new" services under FTS 2000 "places very little limit on what the General Services Administration can add to the contract.

As a practical matter, it did not seem justified to raise a protest for adding frame relay," said David Burgett, a counsel for WilTel from the Washington, D.C. law firm of Hogan & Hartson.

The uncontested addition of frame relay means it "might be easier for FTS 2000 users to add new services, "said Steven Taylor, president of Distributed Networking Associates, a consultancy in Greensboro, N.C.

'There was a trend going with the T-3 and other protests that made it seem that virtually any new service added to the FTS 2000 would be called into question and decided in the appeals process,"

Government telecommunications users cited delays of up to six months for new services because of the protests.

The 10-year FTS 2000 contract is up at the end of 1998 but will be renegotiated in 1996.

The looming expiration date is making it less worthwhile for rivals to fight for business under the existing deal and more inclined to focus on winning business under the renegotiated contract, Burgett said. Z



yberSpeak: Voices from the reader network

Do you think Judge Harold Greene has too much control over the communications industry?

"Yes. It is absurd that the future of communications in this country is the personal fiefdom of one individual, a man who is not an expert in communications technology, is not an elected official and whose self-assigned mandate apparently does not include consideration for whether his actions make communications more available, more reliable, less expensive or more advanced. If the case could be made that a single, private communications carrier should be singled out for special oversight and regulation when its competitors are not, then the obvious candidate for this role is the FCC. AT&T's future should be determined by the markets where its services and strategies affect those deciding

whether or not to purchase them, not by some ivory-tower 'disinterested party.' "

David Breneman, systems administrator of product development platforms, Digital Systems International, Inc., Redmond, Wash.

"The world has changed, and Judge Greene has not. From the time of a dominant 'Phone Company' providing only limited new technology and small players struggling for market share, we have come to a world of many players and technologies not even dreamed of in 1984. Let the competition be in the marketplace, not in Judge Greene's chambers."

David Bell, programmanager, Cali-

fornia Department of Transportation, Sacramento, Calif.

"Because Judge Greene has been so involved in telecommunications rulings for such a long time, he may have a clearer picture of what is going on in the industry, especially regarding AT&T, the RBOCs and potential cross-ownership issues. Until the FCC has the staff to oversee the potential behemoth and the state regulatory agencies can get a larger overview and larger staff to deal with the regulatory issues, Judge Greene may be the best arbiter."

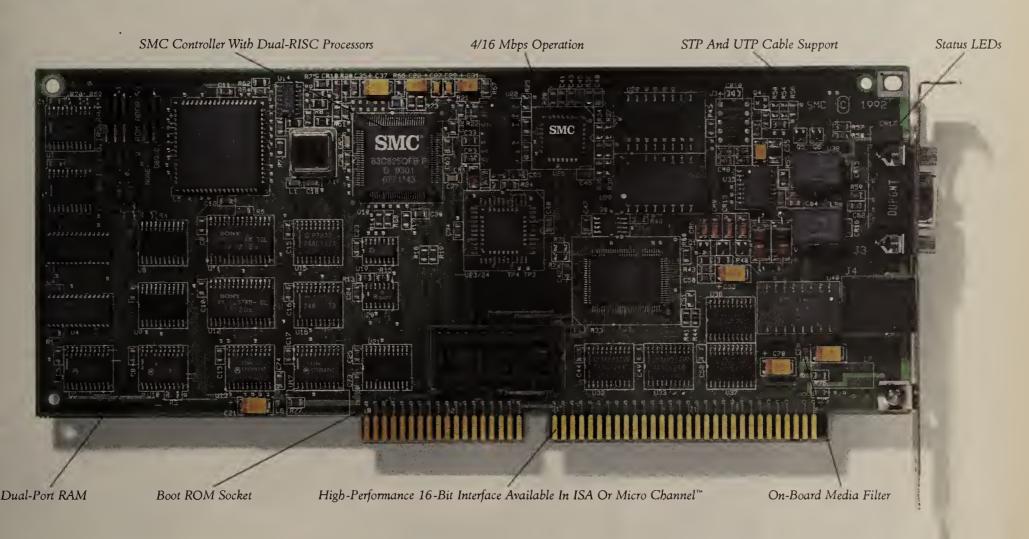
Craig Paul, technical support programmer II, Kansas University Computer Center, Lawrence, Kan.



Will the Clinton administration's ambtious EDI plan make doing business with the government any easier?

Responses due by 8 p.m. Thursday, April 28. You'll get a T-shirt if we print your response. INTERNET: network@world.std.com * COMPUSERVE: 73244,2673 * FAX: (508) 820-3467 * RAF HOTLINE: (800) 622-1108, EXT. 487

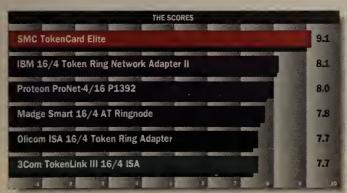
Compatible. Reliable. And at \$249, incredible.



There's a new leader in Token-Ring Technology.

In June 1993, InfoWorld tested the top Token-Ring adapters for speed and flexibility. Guess who came out on top?

Not IBM, Madge or Olicom. But SMC.
The review stated: "Not only did the



In a recent comparison in InfoWorld, SMC came in first.

SMC TokenCard Elite™ offer overall excellence (with excellent or very good scores in every category), it stood out for being among the easiest to install."

The SMC TokenCard Elite is 100% interoperable within IBM environments. It's also fully compatible with both IBM and IEEE 802.5 Token-Ring standards, fully software configurable, and backed by a lifetime warranty. You get lots of extras, too. Like free SNMP management.

But the story doesn't end there. SMC is not only the technology leader but also the low price leader.

In fact, with an incredible new price of \$249 in a 50-pack, and only \$299 for a single card, the SMC TokenCard Elite is priced far lower than any other Token-Ring adapter.

With SMC Token-Ring products priced 50% lower than typical solutions, that can translate into a savings of over \$35,000 per 100-node installation. Without your having to sacrifice quality, reliability or peace of mind.

EZStart: The ultimate installation and diagnostic tool.

Elite

EZStart™, SMC's new Windows-like autoconfiguration and test utility, makes installation and troubleshooting a snap.

Elite

SMC to- EZStart

> Elite 12-Pack

> > Elite

In fact, according to independent network testing laboratory LANQuest Labs, EZStart is "head and shoulders above the others."

In the unlikely event you'll need it, you're also guaranteed the service and support of a company that's been in business for 23 years and has over 6 million nodes installed.

So before you make another Token-Ring purchase, talk to SMC. In addition to the world's best adapters, we offer a full line of intelligent and stack-

able MAUs and hub cards that deliver the lowest cost per managed port in the industry.

SMC also has the industry's first switching hub that supports Token-Ring and the first HMI-compliant Token-Ring hub card.



For information on a free 30-day evaluation kit, call 1-800-SMC-4-YOU.

Contact us today and find out why, if you're not using SMC in your Token-Ring network, you're settling for second best. And paying for it.



Elite/A

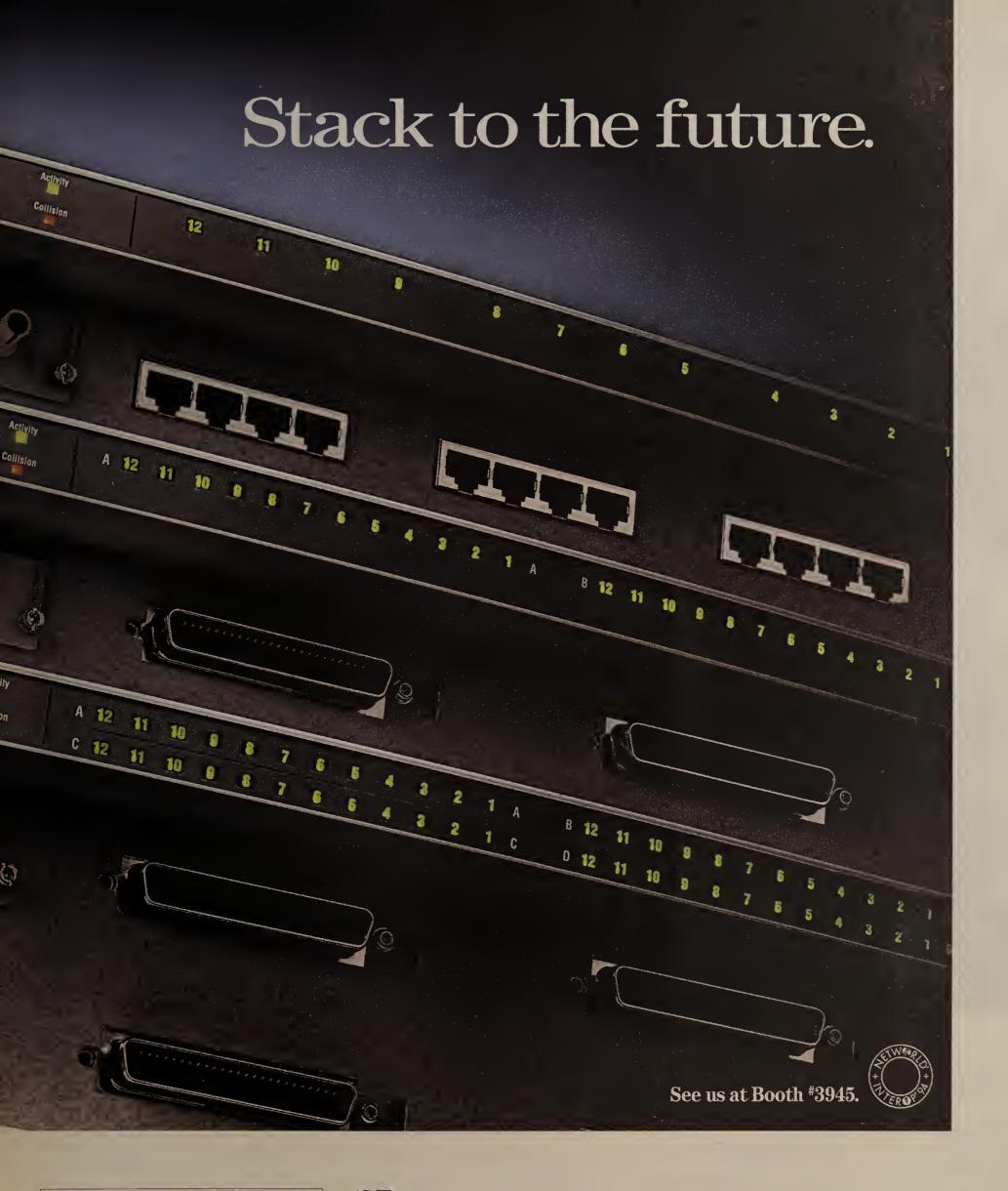




The HP AdvanceStack features an expansion slot that offers a flexible upgrade path to SNMP, bridging/routing, high-speed backbone connections and more.

Introducing the HP AdvanceStack family of 10Base-T stackable hubs.

If you like the front of our new hubs, wait until you see the back. That's where you'll find their unique expansion slot, and proof of their unprecedented flexibility. Buy the HP AdvanceStack today and you get a low-cost solution for your current setup. Then when you



- Full stack manageable via a single SNMP module
- Supports HP OpenView network management software
- Each hub ships with HP Stack Manager, a Windows-based management solution
- Management bus separate from data bus
- Maximum configuration: 784 nodes, 16 hubs
- Available in I2-, 24-, and 48-port models
- · Hub-to-hub connections via industry standards-based cables
- 185-meter hub separation capability
- · Hot-swap capabilities
- i960 RISC processor
- MTBF: 274,000 hours (12-port model)
- Starting under \$90/port

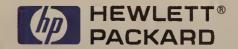


want additional functionality, all you need is a cost-effective NetWork all you need is a cost effective lessed and Approved expansion module, not a new

unit. Add a lifetime warranty* backed by HP's reputation for quality and reliability, and we think you'll want to find out more about AdvanceStack right away. For fast faxed information, call **1-800-964-0714**, or for a full product brochure, 1-800-533-1333, Ext. 8117.[†]

And discover why so many people are looking in back of the stack-AdvanceStack, that is.

Another smart networking product from HP.



Networks are like children.



You can't manage them properly if you don't really understand them.



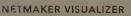
"The Alibi Club"
An original 3-D multimedia
music theatre performance.
Only at booth #5695,
NetWorld+Interop '94

New NetMaker XA: the world's first complete suite of network decision tools.

Automate routine and complex management tasks. Visualize network data, interpret traffic, plan capacity, test resiliency, optimize design, allocate costs. NetMaker XA can help you do it all. And that's only the beginning. You'll reduce costs, bump-up productivity, and increase performance. Individually or together, NetMaker XA tools deliver the power you need to manage any network professionally. For more information call 1-800-545-MAKE Dept. ANW.

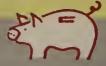








NETMAKER INTERPRETER



NETMAKER ACCOUNTANT



NETMAKER PLANNER



NETMAKER ANALYZER



Enterprise Internets

Data Network Architectures, Standards, Equipment and Management

Company unveils next-generation network designer

BY JIM DUFFY

At a glance

founded as

a software

consulting

company.

Netool, is

shipped for

mux market.

NetMaker.

successor,

products

for router

1994 NetMaker XA

debuts.

market are shipped.

is launched.

Netool's

First

First product,

1986 Make is

Make Systems, Inc. last week unveiled a revamped network design and simulation system that features a new suite of applications

intended to make network reconfiguration planning easier.

The system, called NetMaker XA, runs on a Sun Microsystems, Inc. SPARCstation and is a descendant of Make's popular NetMaker net design

Net Maker XA includes an object-oriented database for easier network modeling and six new applications for tracking and evaluating changes to the network. The applications include Visualizer, Accountant, Planner, Analyzer, Designer and Interpreter.

Visualizer is a graphical data interpretation tool for managing network data. It allows users to query, organize and report data on complex network topologies so they can quickly identify and locate nodes critical to tracking network utilization and changes.

Accountant is a financial modeling and accounting tool that helps users determine carrier charges and allocate bandwidth and equipment costs among net users.

Planner is a device-specific simulation tool that

predicts how the network will handle user-specified changes, including adding, altering or deleting applications, users, protocols, bandwidth and routing

Analyzer works with Planner to help users measure the sensitivity of the network to changes and potential failures. Analyzer evaluates the impact of changing routing protocols, and identifies and documents what changed in the network over time.

Designer allows users to build incremental changes into their networks, such as selecting the

> optimal mix of vendor equipment and bandwidth services to improve cost and performance, or to design redundancy or route diversity plans.

> Lastly, Interpreter, which actually debuted last month (NW, March 21, page 16), provides information on local-area network traffic patterns by gathering data from LAN segment monitors, packet probes and protocol analyzers. It also lets users determine bandwidth needs for particular applications.

Analysts said NetMaker XA provides a more accurate depiction of net activity than the previous NetMaker product.

"It seems to be much more modular so that you can actually write modules that emulate switches or routers," said Glenn Gabriel Ben-Yosef, a senior analyst at The Yankee Group in Boston. "It's the next best thing to putting things live out on the network.'

Prices for Visualizer and Interpreter start at \$6,995. Accountant and Analyzer are priced at \$9,995 each, and Planner

and Designer cost \$14,995 apiece. Plug-in modules cost \$3,000. NetMaker XA will be available in May.

©Make: (415) 941-9800.

Digital outlines plans for Polycenter NetView

BYJIM DUFFY

Maynard, Mass.

Digital Equipment Corp. is prodding users to make the move to Polycenter NetView with insight into product futures, migration paths and pricing incentives.

Polycenter NetView is the successor to Digital's Polycenter Framework, a network and systems management platform that met with limited market success. Polycenter NetView is a Simple Network Management Protocol system, based on IBM's NetView/6000, that will include extensions for DECnet management.

The first release of Polycenter Net-View, Version 2.1, is currently shipping on DEC OSF/1 platforms. And DECnet extensions, called Polycenter DECnet Manager 1.0, will ship in June. It features full DECnet Phase IV/Network Control Program (NCP) management capabilities, including autotopology, mapping and autodiscovery of Phase IV and DECnet/OSI nodes, and management of terminal servers and bridges.

NetView will eventually match, and then surpass, the functionality of DECmcc and MSU.

DECmcc 200 runs on Digital's legacy VAX/VMS and Ultrix systems, and provides management for local-area DECnet networks. DECmcc 400, also available on VAX/VMS and Ultrix platforms, is an enterprisewide DECnet management system.

MSU runs on Ultrix systems and manages Transmission Control Protocol/Internet Protocol and DECnet Phase IV devices using SNMP and Digital's Network Information Control and Exchange (NICE) protocols.

DECmcc will be retired in three to five years, but MSU will be retired "soon," according to the update document. Dennis Biedrzycki, Digital Polycenter marketing manager, said support for MSU will wind down toward the end of the year.

So Digital is also briefing DECmcc and MSU users on various migration paths to the new Polycenter NetView platform. Migration Package 1.0, offer-

BRIEFS

The Management Integration Consortium, recently formed by software developers to spur interoperability among management platforms and applications, next week will announce that 12 vendors have pledged to join the group's steering committee.

According to a consortium press release that will be distributed at the InterOp show in Las Vegas, those vendors include: Bridgeway Corp.; GTE Federal Systems; Hewlett-Packard Co.; ISICAD, Inc.; Ki Networks, Inc.; Martin Marietta Corp.; NetLabs, Inc.; Peregrine Systems, Inc.; Remedy Corp.; Sun-Connect; Ungermann-Bass, Inc. and Unisys Corp.

IBM, meanwhile, is still deciding whether to join the steering committee, according to consortium officials.

The consortium will form working groups to focus on the following areas of network and systems management: a data integration schema, a data access application program interface, event integration and an inventory/configuration schema (NW, April 11, page 1).

Hewlett-Packard Co. last week unveiled Integrated Services Digital Network adapters for its HP 9000 servers and workstations that work with net access products from Ascend Communications, Inc.

The adapters support ISDN Basic Rate Interfaces

(BRI), which specify two 64K bit/sec channels for transmission over dial-up lines, and one 16K bit/sec channel for signaling. HP's workstations and servers can support as many as three BRI adapters for effective throughput of 384K bit/sec.

The adapters can also connect the HP gear to Ascend's Pipeline dial-up router, which connects as many as 30 ISDN channels to an ISDN Primary Rate Interface trunk. HP will jointly market Pipeline with Ascend.

The HP ISDN BRI Link adapter for the 9000 workstations costs \$998. The HP ISDN BRI Link adapters for the 9000 servers costs \$1,500. Both products will be available in June.

HP: (800) 752-0900.

The group of vendors attempting to define a standard for synchronous data compression (NW, March 28, page 1) is looking to coordinate its activities with the Telecommunications Industry Association.

Last week, an official from Adtran submitted a request to the TIA to form a subcommittee within the association's TR30.1 working group that will focus on specifying a synchronous data compression standard. If approved, the subcommittee will comprise the same 22 companies that convened in March, plus any other members that wish to join.

The group will hold its next meeting May 3 in Las Vegas. To attend, contact Mike Osborne at (205) 971-8513 or via the Internet at mikeo@Adtran.com.

Product	Shipping	Functions
Polycenter NetView 2.1	Now for DEC OSF/1	Manages SNMP devices and include some DECnet Phase IV management as optional, unsupported software.
Polycenter DECnet Manager 1.0	June 1994 for DEC OSF/1	Provides autotopology, mapping and autodiscovery of Phase IV and DECnet/OSI devices manageable via NCP; manages terminal servers and bridges.
Polycenter NetView 3.1	August 1994 for DEC OSF/1, March 1995 for Windows NT and September 1995 for OpenVMS AXP	Includes hot-standby failover feature and support for Oracle, Informix, Sybase and Rdb OSF/1 databases.
Polycenter DECnet Manager 2.0	December 1994 for DEC OSF/1, June 1995 for Windows NT and September 1995 for OpenVMS AXP	Enhanced DECnet Phase IV data reporting; management of events; enhanced DECnet/OSI management.

Users are looking forward to some of the functionality promised with Polycenter DECnet Manager.

"Autotopology for DECnet is really important when you have dozens or hundreds or even thousands of DECnet nodes out there," said Matt Holdrege, senior network specialist at PacifiCare Health Systems, Inc. in Cypress, Calif. "If they can get it to work, that would be great. On the old [Polycenter Framework], it was very slow."

Digital will then enhance Polycenter NetView and Polycenter DECnet Manager with new releases during the next 12 to 18 months, according to a customer update document recently distributed to users (see graphic).

In that document, Digital stresses the functionality of the Polycenter Net-View platform as an inducement to current users of its Polycenter Network Manager 200/400 (DECmcc) and Polycenter SNMP Manager 300 (MSU). The document indicates that Polycenter

ed until August, will provide DECmcc and MSU users with a discount of up to 75% on Polycenter NetView 2.1 and Polycenter DECnet Manager 1.0.

As expected, discounts of up to 90% will be offered on the other transition aids: Migration Package 1.1, available from September to December, which includes Polycenter NetView 3.1 and Polycenter DECnet Manager 1.0; Migration Package 2.0, offered from January to June 1995, comprising Polycenter NetView 3.1 and Polycenter DECnet Manager 2.0; and Migration Package 3.0, offered from July to December 1995, which includes Polycenter NetView 4.1 and Polycenter DECnet Manager 3.0.

Digital will also provide training, special deals on Alpha hardware and operating system purchases, and service contract transferals for DECmcc and MSU users moving to Polycenter NetView, the update document stated.

©Digital: (800) 344-4825.

Hotel chain reserves its space in the networking business

Breaks out internal IS as service, software vendor.

Hyatt's RSS offers:

Computerized

system software

Total reservation

reservation

Back-end

reservation

processing

outsourcing

system

BY KEVIN FOGARTY

Oak Brook, III.

Trying to make the most of the money and effort it put into developing a worldwide reservation network, Hyatt Corp. has turned its information systems department into a separate business unit called Regency Systems Solutions (RSS).

The group's first customer is hotel chain La

Quinta Inns, Inc. of San Antonio, Texas, which bought a license to run on its own hardware a modified version of Spirit, the Unixbased computerized reservation system (CRS) Hyatt developed.

La Quinta evaluated the CRS and bought it the same way it would any other piece of software, treating RSS as a vendor, not a competitor, said John Kaegi, senior vice president of marketing for the San Antoniobased hotel chain. "We were looking at reservation systems,

and this seemed like the one that was the most flexible and adaptable to future technology.

"We actually did a lot of customization on the software because we do business differently as a limited-service [hotel] chain than they do as an upscale, full-service chain," Kaegi continued. "And [RSS] was with us every step of the way."

La Quinta licensed Hyatt's CRS to move its reservation system off a Unisys Corp. mainframe as part of a companywide migration toward Unix, said Michael Irelan, manager of application development for La Quinta.

The CRS runs on a Hewlett-Packard Co. 890 Unix server in San Antonio, and hotels dial

in to download reservations and upload accounting and other information, Irelan said.

In addition to selling software, RSS will provide back-end transaction processing for hotel chains that want to maintain their own phone banks to take reservations. RSS will also provide privatelabel reservation systems — answering telephones using the customer's hotel name, making reservations and updating reservation lists at individual hotels, according to John Biggs, the for-

mer Hyatt vice president of hotel accounting and administration who is now RSS' chief operating officer.

RSS was formed a year ago largely as a way for Hyatt to hang on to its experienced, Unix systems development staff, Biggs said. Breaking out as a profit-seeking entity will benefit Hyatt by spreading the cost of systems development out a bit, but it will probably not save more than about 15% of the total IS cost.

After spending six years developing the Unix-based CRS that Hyatt migrated to from a mainframe, "We came to the conclusion that

we had developed a real technology company," he said. "Our technical people and their careers were totally different from the hotel people and their careers."

Hyatt's own reservation system runs on Pyramid Technology Corp. Unix servers and is accessed via remote hotels through a T-1 network using Transmission Control Protocol/Internet Protocol.

Hyatt wanted to retain its RSS developers — and their skills in Unix, Informix Software, Inc. databases and in building applications with Powersoft Corp.'s Power-Builder to run across local- and wide-area networks. "They're a fairly rare breed," according to Biggs.

Without new challenges, the company expected that many of its best systems people would look for work elsewhere. "In the marketplace for people, the best and brightest want to work in a challenging environment for a company that is willing to take some risks," he said.

In addition to the CRS system, RSS will eventually license other hotel automation systems it has developed, such as one for reserving and booking conference space in the hotels.

Rather than booking conference space on a

hotel-by-hotel basis, Hyatt uses a WAN, connecting all of its hotels and tracking on-line the rates, time and space requirements of conferences to be held in its hotels.

"We used to have sometimes 15 salespeople, all from different hotels, calling on one customer," Biggs said. Now salespeople carry

laptops with conference schedules updated from the company's central database. "That allowed the sales force to organize around a total account management solution," Biggs said, referring to a sales approach based on individual attention to customers.

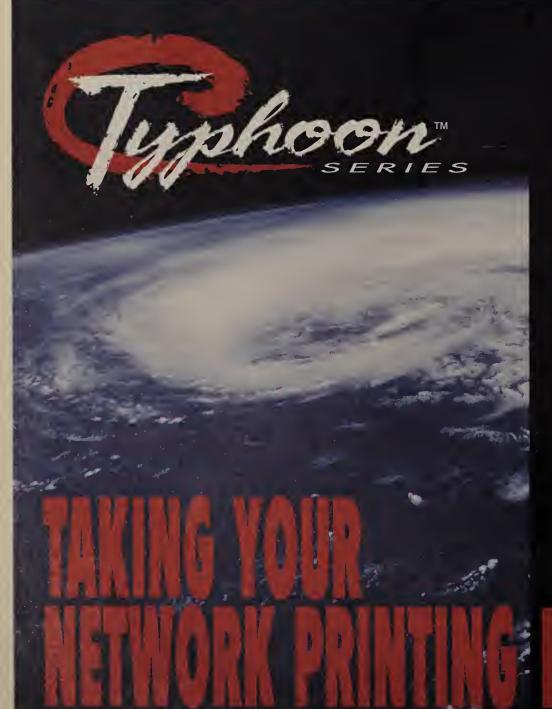
He added that selling Hyatt's CRS to potential competitors will not hurt the hotel chain's business. Unlike airline reservation systems — such as American Air-

lines, Inc.'s SABRE system, which puts competing flights on-line and lets the user choose among them — the RSS system serves only one master: It takes reservations for only one hotel chain at a time.

"We had no concerns at all that we couldn't protect our privacy, even if we had taken [the private-label reservation service] option," Kaegi said.

Improving the competition's IS capabilities won't hurt Hyatt, either, Biggs said. Pooling IS resources among companies with similar needs is financially more efficient than everyone trying to reinvent the wheel, he explained.

The 150-person RSS will keep its headquarters in the Chicago suburb of Oak Brook, Ill., and will probably hire about 30 new systems people to service new clients, Biggs said.



The Typhoon family of laser printers are an irresistible force to meet your network or production printing needs. They offer you a powerful set of features at a surprisingly affordable price. The Typhoon 30 and Typhoon 60 print simplex or duplex pages at 30 and 60 images per minute and have paper capacities of up to 3,000 and

5,000 sheets. Both Typhoons feature 300/400 dpi resolution, ledger-sized imaging, high duty cycles, very low cost-of-ownership, VPT™ network connection, global maintenance and more!

For smaller work groups, Dataproducts' LZR 1580 and LZR 2080 laser printers produce 15 and 20 pages per minute at up to 800 dpi.

P Dataproducts

Harness The Power Of A Typhoon Call Toll Free 800 x 800 dpi (800-980-0374)

IF THIS REMINDS YOU OF YOUR LAN, YOU NEED THE

SCALABILITY

OF VIVID ATM



We can't reduce subway congestion. But we do have a scalable solution for LAN congestion.

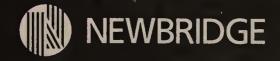
VIVID ATM switches deliver robust traffic control using peak cell rate policing and multiple Quality of Service (QoS) classes with priority queues for user data.

With VIVID traffic control, your ATM LAN dynamically scales to accommodate increasing volumes of bursty LAN traffic as well as bandwidth-intensive multimedia applications.

We're ready for Video, Voice, Image and Data (VIVID). Are you?

Call Newbridge for a free white paper on Building Scalable ATM LANs. 800 DO-VIVID





North and South America, 1 800 343-3600 or 1 703 834-3600

Europe, Middle East and Africa, 44 (0) 633 413602 | Asia Pacific, 1 613 591-3600

Athens • Atlanta • Auckland • Bahrain • Beijing • Boston • Brussels • Buenos Aires • Caracas • Chicago • Dallas • Denver • Geneva • Hong Kong Johannesburg • London • Los Angeles • Mexico City • Miami • Minsk • Montreal • Moscow • New Delhi • New York • Paris • Rio de Janeiro • Rome St. Petersburg • San Francisco • Santiago • Seattle • Shanghai • Singapore • Sydney • Tokyo • Toronto • Vancouver • Washington

INTERNET

by Ed Krol

Debunking the bandwidth myths



veryone is talking networking these days, has networking experience and knows enough about networking to be dangerous. No longer does

it take a tool belt and a third-class guru license to get an Internet connection.

With the pervasiveness of 10Base-T, anyone who can plug in a phone, copy a disk and enter

three rather bizarre numbers into a spreadsheet can connect a machine to the Internet. On the other hand, many of these people haven't a clue as to what the capabilities and limitations of this connection really are.

The confusion centers around the two myths of bandwidth. The first is that there isn't enough. The second is that communication can't stress a machine.

These myths were brought home to me recently while I was talking to a person who was bemoaning the design of the new network in his building. "It's 10Base-T; its only 10M bit/sec," he said.

When I asked him what he needed more speed for, he looked incredulous. "We're going to be doing multimedia," he said.

It was obvious from his delivery that hearing the word "multimedia" was supposed to justify his statement and make me look agape with awe. I'm sorry, but the word really didn't have the expected effect.

His problem was that he had heard Ethernet is slow; you could only expect 1M or, at the

outside, 2M bit/sec throughput because of all those nasty collisions.

But television is multimedia, and he has more than a broadcast television channel's worth of bandwidth at his disposal. Using a wellengineered Ethernet with perhaps a switch rather than a repeater at the hub could easily allow



him to use all of it, if only the computers had the power to do it.

This is where the second myth comes into

People were conditioned in the day of the modem to think that if things went slower than you wanted, it was because you had a slow communications link. If you wanted to go faster, you would replace your modem with a faster one — running 2,400, 9.6K, 14.4K bit/sec

People never gave any thought to the idea that eventually you could communicate so fast it would start stressing your computer. They are sure that if they had an FDDI or 100Base-T card for their machine, it would immediately start communicating at 100M bit/sec, no questions asked.

The corollary to this second myth views communications as something your machine does with the network. Obviously, the data is just swirling around in the infamous network cloud out there, and if you had a 100M bit/sec pipe, you could drain the cloud that fast. And, using this model, there is no limit to the number of computers that can have spigots to the cloud, and they can all drain it simultaneously without degradation.

There is no recognition that client/server computing is an end-to-end, computer-to-computer process. The multimedia data to be accessed must be served from a computer somewhere.

It is unlikely that a server is dedicated to serving your singular machine. (If it were, why bother with the network? Put the data on local disk.) It is most likely shared, serving any number of client computers.

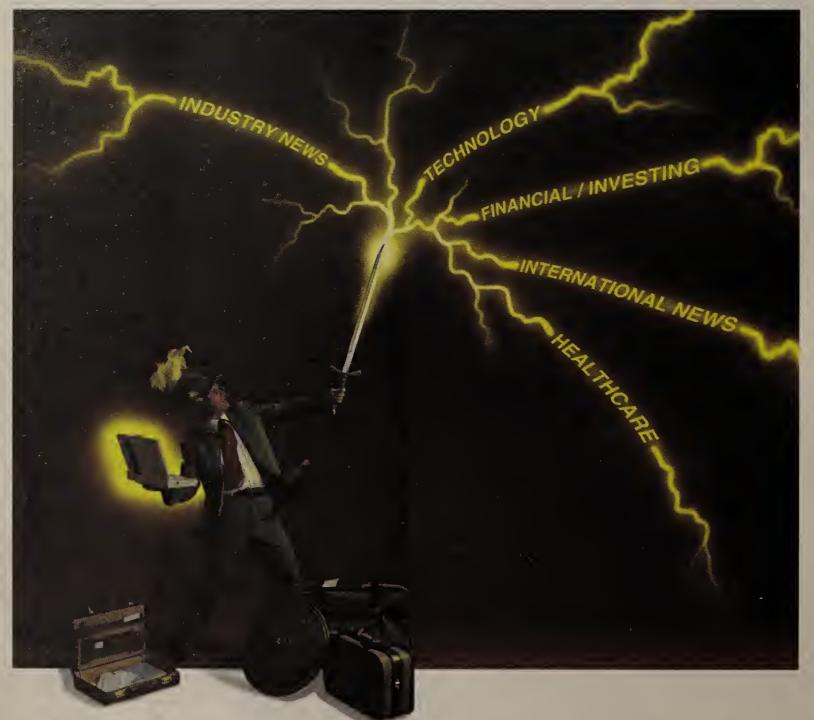
The reason networking is hot is because it's a cost-effective way of sharing things. But sharing means that sometimes someone else is using what you want.

When someone else is using it, you might have to wait until they are done, or it will go slower for both of you. It is a lesson most people learn at an early age.

Perhaps Robert Fulghum's All I Really Need To Know I Learned In Kindergarten should be required reading for network users.

Krol is the author of The Whole Internet (O'Reilly & Associates, Sebastopol, Calif., 1992) and assistant director for local-area network deployment at the University of Illinois at Urbana-Champaign. He can be reached at e-krol@uiuc.edu.

WIRELESS INFORMATION DELIVERY FROM MOTOROLA



WIRELESS INFORMATION: Power for the Road Warrior!

Information is power, and EMBARCSM delivers it to the people who need it most—road warriors like you! EMBARC Information Services will keep you tuned to a variety of interests, and the world at large, to put you a step ahead in today's fast-moving, competitive marketplace.

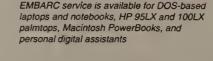
Your EMBARC subscription includes general news and weather from USA TODAY at no additional charge. To boost your productivity even more, additional wireless information is available through optional services from USA TODAY, INDIVIDUAL, Inc., Reuters and other sources.

USA TODAY News Specialty Services offer a wide range of topics, including, Health, Energy, Real Estate and Travel. Reuters Financial Updates provide fresh, hourly reviews of the business and financial world, including most-active stocks, commodity prices, stock market averages and more.

With HeadsUp™ industry news from INDIVIDUAL, Inc. you'll receive targeted wireless news briefs that impact your industry and professional specialty. Concise story briefs provide a quick read and eliminate information overload, and optional full-text retrieval provides details when needed. These and other information services are the perfect complement to EMBARC's fully featured one-way wireless networking capabilities, including wireless E-mail, reports and file updates. The total service will keep you in the loop and productive in over 230 major markets in the U.S. and Canada.

Call 1-800-EMBARC4, ext 360 to see what the power of wireless information can do for you.





DOS, MAC compatibility:

Send Me VIVID White Papers!

- Building Scalable ATM LANs
- Managing ATM Virtual LAN Workgroups
- ATM Virtual Router Architecture
- ☐ Issues in ATM LAN Emulation

Name	Title		
Company			
Address			
City/State/Zin	Telephone		



1 800 DO VIVID







NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 8110 HERNDON, VA

POSTAGE WILL BE PAID BY ADDRESSEE

Newbridge Networks Inc. ATTN: VIVID 593 Herndon Parkway Herndon, VA 22070-5241



IF THIS REMINDS YOU OF YOUR LAN, YOU NEED THE

BANDWIDTH

OF VIVID ATM

Tired of contending for bandwidth in your shared media LAN? We can give you dedicated bandwidth.

VIVID ATM LANs allow Ethernet traffic to be switched onto an ATM network at wirespeed. Each desktop gets dedicated 10 Mbps LAN-per-port connectivity. And you get to keep your existing Ethernet interfaces, wiring and budget intact.

LAN servers can connect to VIVID ATM switches at 155 Mbps to support bandwidth-hungry applications. And Ethernet-attached clients can talk to ATM-attached servers because VIVID ATM LANs support concurrent routing and bridging.

We're ready for Video, Voice, Image and Data (VIVID). Are you?

Call Newbridge for a free white paper on Building Scalable ATM LANs. 800 DO-VIVID





North and South America, 1 800 343-3600 or 1 703 834-3600

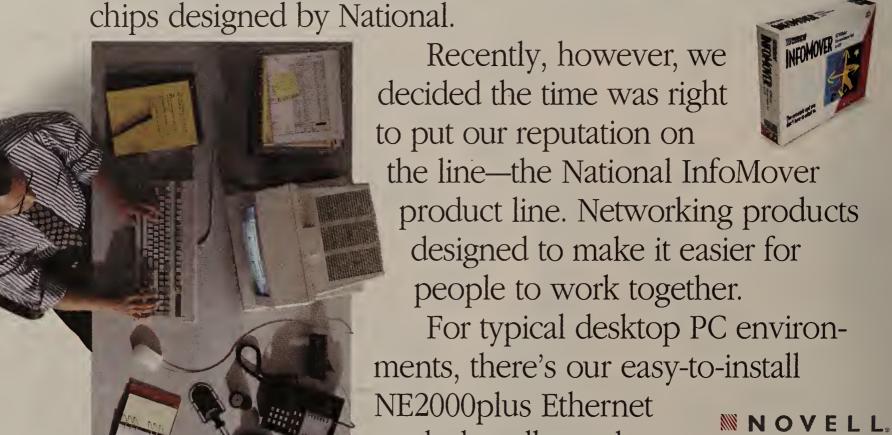
Europe, Middle East and Africa, 44 (0) 633 413602 | Asia Pacific, 1 613 591-3600

Athens • Atlanta • Auckland • Bahrain • Beijing • Boston • Brussels • Buenos Aires • Caracas • Chicago • Dallas • Denver • Geneva • Hong Kong Johannesburg • London • Los Angeles • Mexico City • Miami • Minsk • Montreal • Moscow • New Delhi • New York • Paris • Rio de Janeiro • Rome St. Petersburg • San Francisco • Santiago • Seattle • Shanghai • Singapore • Sydney • Tokyo • Toronto • Vancouver • Washington

National InfoMover.

We'd like to let you in on one of the best kept secrets in the industry: National Semiconductor has quietly become one of the most experienced networking companies.

In fact, there's a very good chance that, if you work in a PC network, you've worked with us before. Because 2 out of every 3 Ethernet cards installed in desktop PCs today use



group of people to communicate and share network

cards that allow a large

More than just compatible.
For those of you who want

the security of knowing that your network cards are "Red Box" compatible,

rest assured that InfoMover cards are all

that—and more.

resources. For PC workstations and file servers, there's our high-performance FDDI cards.

For those who value mobility, there's our InfoMover NE4100 PCMCIA Ethernet Adapter for notebook PCs with a

For those in the office.

The Network Connection.

Type II slot. Unlike PCMCIA cards available from some other LIFETIME premium suppliers, the WARRANTY NE4100 fully supports

Thanks for the support.
We offer 24-hour-a-day,
7-day-a-week, toll-free
technical support. And
InfoMover products come
with a lifetime warranty.

industry-standard card and socket services. In fact, with InfoMover soft-

INFOMOVER

Ethernet PCHCIA
Adapter Card

R NOVELL

The power is on.
The InfoMover NE4100 PCMCIA Ethernet Adapter supports card and socket services so it can be "hot-swapped," inserted into or removed from a notebook while it's on.

MAGAZINE
EDITORS
CHOICE
December 21, 1993

ware installed on your notebook, PCMCIA cards—such as our NE4100 card—can be "hot-swapped," inserted and removed without the notebook being turned off each time.

In addition, all InfoMover products have



Give us a ring.
We've put together a short, informative videotape that outlines the advantages of the InfoMover product line. Just dial 800-227-1817, ext. 32.
The call and the tape are free.

been codeveloped with Novell to ensure that they'll seamlessly integrate with NetWare® environments. And they're compatible with virtually all industry-

standard hardware and software, including Microsoft, IBM, and Banyan networks.

If you'd like to know more about how InfoMover fits in with the way you work, call us at 800-227-1817, ext. 32.



And those on the go.

And then they said,

66

EDITORS' CHOICE

The AsanteHub offers both expandability and manageability for a low pernode cost. These products provide enterprise features for a workgroup price.

-PC Magazine

HE ASANTÉHUB 1012 IS A 12-PORT, 10BaseT Ethernet hub that works right out of the box. Asanté also offers,

-LAN Times

It provides a low-cost intelligent Ethernet hub solution that is both flexible and expandable.

-MacWEEK

The 2072 is also equipped with a dual-segment backplane, and it has seven slots for various multiport repeater modules and

-LAN Times

For connecting the hubs, Asanté Technologies' three-in-one port (unique among the hubs in this roundup) lets you use an RJ-45, BNC, or AUI connector, allowing flexible cabling options.

-PC Magazine

This makes it a definite "must-see" for anyone who manages a medium- to large-sized Ethernet network.

-LAN Times

All modules are hot-swappable, so they can be removed from the chassis without interrupting network operation.

-PC Magazine

Both the in-band and out-of-band management modes share a common, native Windows (or Macintosh) interface. Both modes offer easy-to-understand menus, along with more onscreen statistical graphs and charts than you can shake a stick at.

-LAN Times

Another of the AsantéHub's particular strengths is that everything in the package is not only well-designed but well-executed.

-PC Magazine

Altogether, the package is easy to use and offers nearly every imaginable monitoring feature.

-LAN Times

The AsantéHub is a premium device at a bargain price, and it fits into the ever-expanding Ethernet market. Asanté Corporation's great reputation continues with the AsantéHub 1012.

-Macworld

The new departmental-sized 2072 hub from Asanté Technologies Inc. brings total Ethernet connectivity, modularity, functional integration, and tons of networkmonitoring features

-LAN Times

AsantéView also lets you monitor network-performance statistics in either graphical or tabular views.

-MacWEEK



The AsantéView software is very mature and easy to use but powerful.

-PC Magazine

The array of functionality provided by AsantéView is almost mindboggling.

-MacWEEK

in the AsantéView software is a fantastic mapping function as well as performance meters for the most complete hubmanagement system available.

-Macworld

Call for your FREE Guide to Ethernet Networking.

(800) 662-9686





AsantéHub 2072

•Multi-segment Backplane

• Hot-swappable Modules

•RISC-based Bridge •SNMP Management AsantéHub 1012
•Expansion Slot for SNMP
or Bridge Module
•Eul LED Display

•Full LED Display
•3-in-1 Backbone Port

AsantéView Software
•Graphical Interface
•Macintosh, Windows and NMS
•In-band and Out-of-band
•SNMP

Non-Managed Hubs

•NetExtender Hubs Create or
Extend 10BaseT Networks and Plug
Directly Into AUI or AAUI Ports.

•Plus 8 or 12 Port 10BaseT Hubs

LOCAL NETWORKS

Operating Systems, Management, Hubs, Adapters and Other Equipment

DESKTOP SYSTEMS

DMTF finalizes desktop management specification

BY SKIP MACASKILL

Hillsboro, Ore.

The Desktop Management Task Force (DMTF) this week will announce that it has finalized the Desktop Management Interface (DMI) specification and expects to see products based on the spec as early as the third quarter.

The DMTF, which was formed two years ago to ease desktop systems man-

For Network World's view, see the Editorial on page 40.

agement in enterprisewide networks, is also to announce that it will make a software developers' kit (SDK) available this summer that users can employ to build DMI-based management appli-

Vendors will incorporate DMI code

into personal computers and other products to allow users to cull a variety of management information from not only the desktop device itself, but also integrated or attached peripheral com-

A DMI management application accesses information from a Management Information File (MIF), which runs on the managed desktop and describes the PC and workstation components associated with that device as well as the management information related to those components.

"Managing the plumbing of the network — the structured wiring and network devices - is pretty much a done deal, so users are starting to focus on improving their control over the desktop systems they have in place," said John McConnell, president of McCon-

See DMTF, page 24

End of the line for NetWare 2

Novell launches aggressive discounting to spur upgrades.

BY CARYN GILLOOLY

Provo, Utah

NetWare 2, originally known as NetWare 286, will soon be history.

Novell, Inc. last week said that effective June 1, it will no longer offer five- and 10-user versions of Net-Ware 2.2, the last remnants of the 2.X product line. Novell stopped selling 50- and 100-user versions of NetWare 2.2 last August.

In conjunction with the announcement, Novell launched Upgrade 1994, an aggressive discounting plan that lets users migrate until August from NetWare 2.2 or NetWare 3.1X to either NetWare 3.12 or Net-Ware 4.01 at 25% off the usual upgrade price.

Novell is also offering these discounts to users considering moving from other vendors' network operating systems to Net Ware.

A PIECE OF THE PAST

NetWare 2.X customers still represent a significant portion of Novell's installed base. Of the two million Net Ware servers installed, about 600,000 are running NetWare 2, according to Novell (see graphic).

Nevertheless, company executives said Novell's newer products — such as NetWare 3 and NetWare 4 have far surpassed NetWare 2 and earlier Novell

"We've officially closed the book on NetWare 2.2," said Toby Corey, senior director of marketing for Novell's network products division here. "We'll continue to provide support [for NetWare 2.2] through July of '95, but after that, support will only be provided via Novell Authorized Service Centers."

Corey explained that today, customers get support either directly from Novell or, most often, from local

resellers that get support directly from Novell. After July 1995, however, neither customers nor resellers will be able to get direct Novell support on NetWare 2 networks.

Novell said customers and resellers won't take an issue with the announcement to discontinue NetWare 2.2.

"Most 2.X customers thought we discontinued it a year ago," Corey said.

Resellers and analysts, concurred. "This is not a big deal for me," said Michael Gansl, president of Netlan, Inc., a platinum reseller in New York. "We haven't sold any NetWare 2.X since NetWare 3 came out."

Added Ravi Gulati, president of StonyBrook

Technologies, Inc., a platinum reseller in Bohemia, N.Y., "This doesn't affect us . We haven't sold Net-Ware 2 for so long that I can't even think of anyone that's using NetWare 2."

"NetWare 2 is a dead-end product," said Josh Penrod, an industry analyst at Currid & Co., a research and consulting firm in Houston. "Novell's gone just about as far as it could go with that product."

See NetWare, page 24

Pieces of the

NetWare pie

NetWare 2.X

servers

55%

NetWare 4.X

servers

30%

NetWare 3.X

*There are approximately

2 million NetWare servers

servers

BRIEFS

Themis Computer this week is expected to bring out a new SPARCbased high-availability network server.

Called the Gemini Fault Tolerant ComServer, the new machine provides duplication of all components from SCSI II controllers to the power supply — in a single enclosure. It can be configured with redundant dual MicroSPARC-, HyperSPARC- or SuperSPARCbased microprocessors. The Com-Server runs SunSoft, Inc.'s Solaris operating system, and Themis has built software on top of the operating system that automatically replicates application software across two or more processors.

The Gemini Fault Tolerant Com-Server is available now with pricing starting at \$50,000.

Themis: (510) 734-0870.

IBM and Motorola Corp. last week announced that they have completed development of the PowerPC 604 microprocessor, which is expected to have twice the performance of existing processors. The PowerPC 604 will be used by Apple Computer, Inc., IBM and other vendors to build workstations and servers that can support advanced multimedia and graphics applications.

The 604 is a 100-MHz processor based on the Reduced Instruction Set

Computing architecture as well as technologies and processes from IBM and Motorola. Among the operating systems supported by Power PC are Apple's System 7, IBM's AIX and OS/2, as well as DOS, SunSoft, Inc.'s Solaris and Microsoft Corp.'s Windows and Windows NT.

Hewlett-Packard Co. last week named Richard Watts, an HP vice president, to run the company's Personal Information Products Group in Santa Clara, Calif. Watts replaces Robert Frankenberg, who left HP earlier this month to become president and chief executive officer of Novell,

HP's Personal Information Products Group produces personal computing products ranging from palmtop computers to a full line of desktop personal computers, PC servers and nigh-speed networking products.

ECCS, Inc., based in Tilton Falls, N.J., last week rolled out a faulttolerant disk array subsystem that simultaneously supports Redundant Array of Independent Disks (RAID) Levels 0, 1, 3 and 5. The RAID Module FFT-1035 is a 19-inch rackmount system that offers storage capacity from 5G bytes to 42G bytes. Pricing begins at \$32,000.

ECCS: (800) 322-7462.

Banyan to add shadow feature to StreetTalk

BY CHRISTINE BURNS

Atlanta

Hiding in the shadows

to a VINES or Enterprise Network

Services net by replicating access

rights stored on a master StreetTalk

directory server to shadow servers.

These servers remain dormant until

the master server fails.

By the end of the year, Banyan Systems, Inc. will add to its StreetTalk III enterprise directory service a partial replication feature that will give users access to

the network, even if the primary directory server goes down.

James Toga, principal sonware engineer for StreetTalk III, said this new shadowing function will ensure StreetTalk logon by replicating user access rights onto a shadow or backup Street-Talk server.

The StreetTalk server holds the database of Street-Talk addresses, attributes and access rights. Today, when that server goes down, the users that typically log on through it will be denied net access.

Toga said the shadow servers will remain dormant until the primary StreetTalk server, or master server, becomes inoperable. When a StreetTalk server is going down, it will send a message to the shadow server to accept the logon requests for all users resi-

According to Toga, shadowing should be included in StreetTalk that is shipped with the next major release of VINES, which is expected before year end.

access rights up to two shadow servers, and, when data is altered on the primary server, those changes will also be made on the shadow servers.

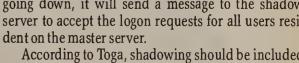
"We have no plans for full-server replication because we feel that process opens up too many secu-

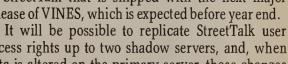
> protected data is copied to too many places, it becomes that much less protected," Toga plained.

which completely replicates server data throughout the net by copying access rights to another server, Banyan's solution

decreases the chance of users accessing files or data for which they don't have clearance, Toga added.

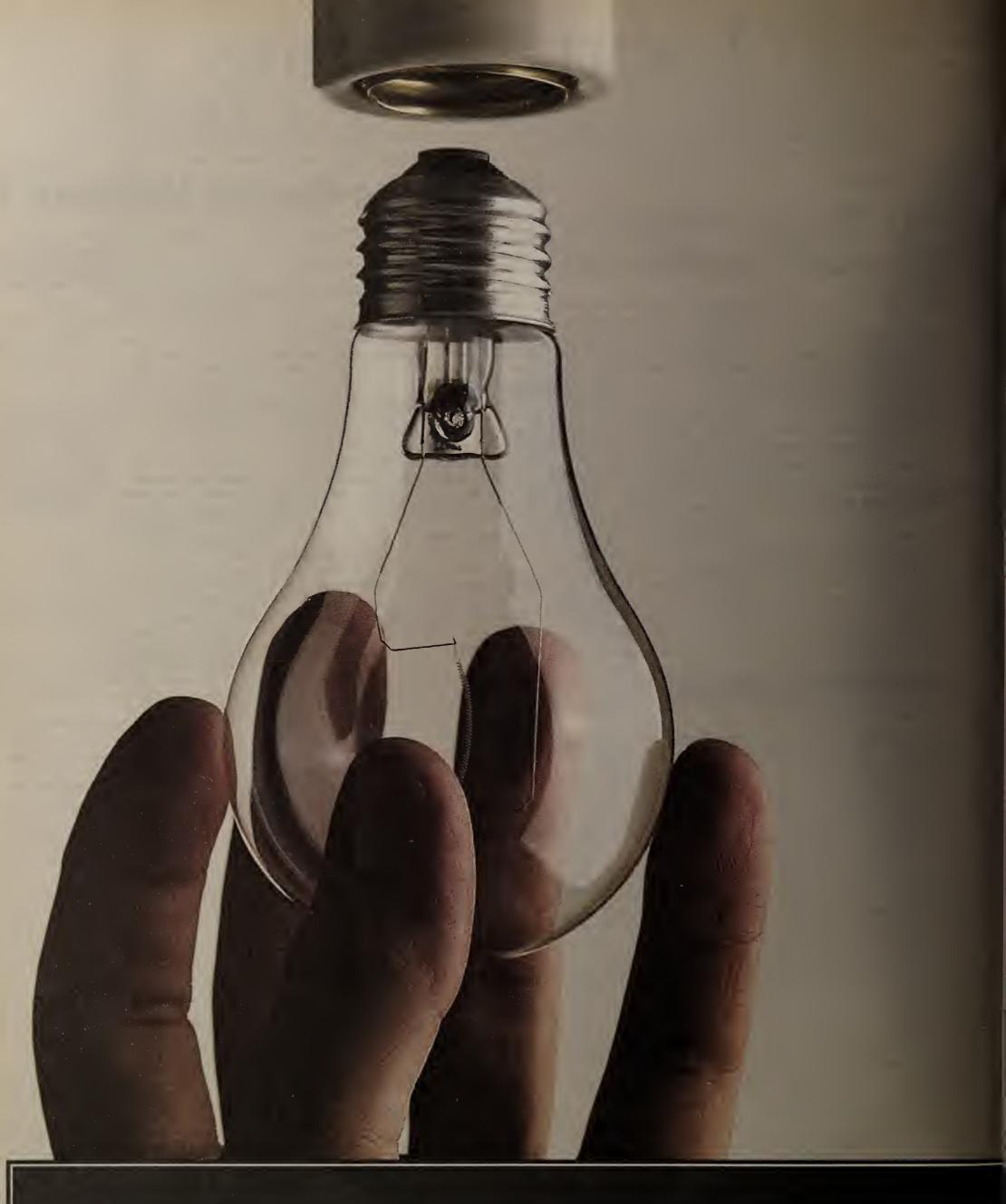
'Banyan is on the right track with this partial replication because it gives me a little bit of fault tolerance without breaking down the security I need on my





rity holes because if the Banyan's StreetTalk directory shadowing capability guarantees users access

Unlike Novell, Inc.,



Putting Technology

If It's This Easy To Use, It Must Be A Digital Router.

Ease of use is what puts our family of multiprotocol routers light-years ahead. For example, you can install and configure our **DECNIS™** backbone routers with award-winning simplicity. They give you network power so reliable, you simply turn it on and it's there. Their advanced management makes your network more versatile. And it's as easy to add FDDI or ATM as it is to change a light bulb. Our access routers make things easier, too. The DECwanrouter 90 gives you lowcost multiprotocol capability. And the DECbrouter 90 easily handles virtually every popular protocol, including IGRP. Both plug and play as standalone units or as snap-in **DEChub** modules, giving you the industry's most flexible architecture. Like all our routers, they're software upgradable on-line from a central load host. And they're backed by one of the world's most complete, most experienced support organizations. We invented bridging and routing, and we are building on that expertise to make your life easier. When you see it in that light, it's a simple decision. Call us to find out how easy it can be.

CALL1-800 DIGITAL

digital

NetWare price cuts

To help boost sales of NetWare and encourage customers to upgrade to newer versions, Novell is offering a 25% discount through July 31 to all customers who upgrade to either NetWare 3.12 or NetWare 4.01

	ire 3.12 (THE RESERVE OF THE PERSON NAMED IN			
NetWare 3.12 upgrade				NetWare 4.01 upgrade			
	Ware 2.2 to			From NetWare 2.2 to NetWare 4.01			
No. of 2.2 users	No. of 3.12 users	Original price	Discount price	No. of 2.2 users	No. of 4.01 users	Original price	Discount price
5	5 10 25	\$585 \$2,125 \$3,445	\$440 \$1,595 \$2,585	5	5 10 25	\$830 \$2,630 \$4,130	\$625 \$1,975 \$3,100
10	10 25 50	\$1,360 \$2,680 \$4,110	\$1,020 \$2,010 \$3,058	10	10 25 50	\$1,940 \$3,440 \$5,040	\$1,455 \$2,580 \$3,780
50	25 50 100	\$1,295 \$2,725 \$4,925	\$970 \$2,045 \$3,695	50	25 50 100	\$2,180 \$3,780 \$6,280	\$1,635 \$2,835 \$4,710
100	50 100 250	\$1,340 \$3,540 \$9,590	\$1,005 \$2,655 \$7,195	100	50 100 250	\$2,520 \$5,020 \$11,920	\$1,890 \$3,765 \$8,940
From Net	Ware 3.11	to NetWa	are 3.12	From Net	Ware 3.1X	to NetW	are 4.01
No. of 3.11 users	No. of 3.12 users	Original price	Discount price	No. of 3.1X users	No. of 4.01 users	Original price	Discount price
5	5 10 25	\$395 \$1,985 \$3,305	\$295 \$1,490 \$2,480	5	5 10 25	\$705 \$2,505 \$4,005	\$530 \$1,880 \$3,005
10	10 25 50	\$595 \$2,335 \$3,765	\$445 \$1,750 \$2,825	10	10 25 50	\$1,625 \$3,125 \$4,725	\$1,220 \$2,345 \$3,545
20	25 50 100	\$695 \$2,935 \$5,135	\$520 \$2,200 \$3,850	20	25 50 100	\$2,495 \$4,095 \$6,595	\$1,870 \$3,070 \$4,945
50	50 100 250	\$995 \$4,235 \$10,285	\$745 \$3,175 \$7,715	50	50 100 250	\$3,150 \$5,650 \$12,550	\$2,365 \$4,240 \$9,415
100	100 250	\$1,395 \$8,895	\$1,045 \$6,670	100	100 250 500	\$4,390 \$11,290 \$19,745	\$3,295 \$8,470 \$14,810
250	250	\$2,495	\$1,870	250	250 500 1,000	\$7,825 \$14,520 \$36,120	\$5,870 \$10,890 \$27,090
Ugrading	users on h	letWare	3.12	From Net	Ware 4.0X	to NetW	are 4.01
	No. of users (After upgrade)	Original price	Discount price	No. of 4.0X users	No. of 4.01 users	Original price	Discount price
5	10 25	\$1,985 \$3,305	\$1,490 \$2,480	5	10 25	\$2,315 \$3,815	\$1,735 \$2,860
10	25 50	\$2,335 \$3,765	\$1,750 \$2,825	10	25 50	\$2,680 \$4,280	\$2,010 \$3,210
25	50 100	\$2,935 \$5,135	\$2,200 \$3,850	25	50 100	\$3,335 \$5,835	\$2,500 \$4,375
50	100 250	\$4,235 \$10,285	\$3,175 \$7,715	50	100 250	\$4,830 \$11,730	\$3,625 \$8,800
100	250	\$8,895	\$6,670	100	250 500	\$10,155 \$18,035	\$7,615 \$13,525
				250	500 1,000	\$11,480 \$33,080	\$8,610 \$24,810
GRAPHIC BY	SUSAN J. CHAMP	ENY		500	1,000	\$22,915	\$17,185

NetWare

Continued from page 21

But not all Novell customers agreed. "I'm not happy with Novell for doing this," said Ted Schroeder, senior personal computer technician at Indiana Hospital in Indiana, Pa. According to Schroeder, Indiana Hospital has about seven NetWare 2.X servers as well as one NetWare 3.12 server.

The 2.X servers, he said, support departmental applications such as accounting, word processing and spreadsheets, as well as a database for all the information used in these applications.

"Our systems are functioning just fine," Schroeder added. "Apparently [Novell thinks it is] so big, it can just cut off its customers and force us to upgrade."

With Upgrade 1994, that's exactly what Novell is hoping for.

"Upgrade '94 is designed to get 2.X customers to upgrade to NetWare 3 or, preferably, NetWare 4," Corey said.

But Schroeder said he won't bite. "I'm not going to upgrade until we see a need," he said. "The issue isn't pricing, it's timing. Upgrading means there's downtime involved and a learning

According to analysts, most other 2.X customers will not move, either. "The upgrade discounts will not drive customers to upgrade," said Jack Karp, president of Affinity Research Corp., a research and consulting firm in Greenwich, Conn.

"They'd need a more compelling reason than that to move," he added.

Inevitably, some customers will take the pricing bait. But, according to resellers and analysts, 2.X customers that choose to upgrade will likely migrate to NetWare 3.12 rather than

LANNET makes network management push for hub line

"You have no

future in the

hub business

without such

[management

offerings],"

Howard said.

BY SKIP MACASKILL

LANNET, Inc. last week issued a new release of its MultiMan management package that allows users to create and manage virtual LANs across multiple hubs.

The vendor also forged a strategic partnership with Armon Networking, Inc. to bring Remote Monitoring (RMON) functionality into LANNET's hub line.

"Network environments are getting increasingly complex, so it's imperative that the device vendors

provide products that help simplify management," said Michael Howard, president of Infonetics Research, Inc.

"This is especially true of the hub players since their devices control the desktop and net segment connections," he added. "You have no future in the hub business without such [management offerings]."

The highlight of LANNET's new MultiMan for OpenView (Multi-

Man/OV) 2.0 software package is a VirtualMaster application that allows net managers to define virtual local-area networks consisting of desktops physically linked to different hubs. The LANNET software can either run on a Hewlett-Packard Co. OpenView console or as a stand-alone application. Most competing virtual LAN capabilities are restricted to a single hub.

Using LANNET's existing Hub Zoom application a real-time graphical display of a MultiNet hub's front panel — net managers can assign users to different logical workgroups by pointing and clicking.

Depending on the hub modules in use, net manag-

ers can group users via software on a per-module, persegment or per-port basis, supporting as many as 256 virtual LANs.

The vendor also rolled out InterMaster, a bridge management application that lets users manage its Ethernet and token-ring local bridge modules.

LANNET, based here, also added RMON capabilities to its product mix, rolling out an RMON module for the MultiNet line as well as an application for MultiMan/OV that allows users to manage the module and

access a variety of RMON management data from it.

The four-port Integrated Ethernet Remote Probe (IERP) is a Reduced Instruction Set Computing-based RMON probe that supports Ethernets full RMON suite. A token-ring version will be available in a future release.

The probe, based on Armon technology, will simultaneously monitor MultiNet's four internal Ethernet buses.

RMONMaster is a MultiMan/OV application that allows users to employ RMON to baseline their network traffic on a per-segment basis. It also lets administrators graphically display RMON statistics and generate reports that identify end nodes producing the most traffic or errors on a network.

MultiMan/OV and IERP will be available next month. MultiMan/OV 2.0 costs \$3,995, while IERP is tagged at \$4,995. The VirtualMaster and InterMaster applications will ship free of charge with 2.0, and the RMONMaster software will cost \$3,995.

©LANNET: (714) 752-6638.

DMTF

Continued from page 21

nell Consulting, Inc., a consultancy in Boulder, Colo. "No one company can do this now, but DMI is a big step forward in getting that done.

With the specification finalized, the DMTF will concentrate on getting vendors to develop products that are DMI-ready, with widespread deployment hopefully occurring in the first half of

"Now that the spec is done, we need to get product to market and show the user how DMI can ease management woes at the desktop," said Shannon Gray-Voigt, industry standards marketing manager at Intel Corp., which is one of the DMTF's eight charter members. "If enough vendors get behind this effort, the user will end up with a common way to cull management data from a variety of desktop devices, regardless of the

The operating system vendors are expected to be the first suppliers out the door with DMI-ready products. According to Gray-Voigt, Novell, Inc. is likely to integrate DMI into NetWare by year end, while IBM is expected to incorporate DMI into Version 2.2 of OS/2 either this quarter or next.

In addition to the SDK, the

DMTF is exploring ways to introduce DMI functionality to existing devices. "We're looking at the possibility of shipping users a kit with some type of scanning application that will let them scan their current desktop systems setup into a MIF so older and existing gear can be retrofitted with DMI," Gray-Voigt said.

According to McConnell, while the value of DMI is obvious, there still remains the question of whether it will actually work when introduced into real-world production networks.

"If done correctly, DMI has the potential to make installation and configuration problems go away," he said. "We won't know if that will truly happen until vendors start delivering and users start deploying this technology. This much we do know: If a user can simply plug in a board to his PC and run a DMI file that will automatically configure the PC into the network, then DMI will be huge."

Other expected benefits from DMI include automatic software distribution, asset inventory management and more preventative maintenance since DMI can monitor the amount of available disk space and time left on product warranties.

©DMTF: (503) 696-9300.

Comments?

See "Contacts" box on page 2.

Banyan Continued from page 21

net," said Michel Gauthier, a systems manager at the National Defense Department of Canada in

But, he said Banyan also needs to work on addressing the problems that arise in a VINES net when a StreetTalk router goes down. Gauthier explained that if one of the routers in a VINES net goes down, all packets that have been routed to that device are lost.

According to Mike Wixon, manager of technical services at Banyan, the company has already addressed the problem of possible downed routers with a VINES patch issued earlier this year.

"Unlike the StreetTalk server setup where each user has a particular server to log on to, there is no designated router for VINES users," Wixon said. He explained that every user can send data around the network via any router.

"We used to have the problem of lost data if a router went down in the middle of a transmission, but we included routing redirect technology in the last release of VINES that remedies that problem," Wixon explained. This feature redirects data packets away from an inoperable router and, therefore, protects the data, Wixon added.

©Banyan: (508) 898-1000.

Cut me in.

Send more information on your intelligent hub solutions.

To receive our "Blueprint for Structured Networking" planning kit, which includes a free demo disk, video tape and informative brochure, just complete this card and drop it in the mail.

Name ______
Title _____
Company _____

Address _____

City/State/Zip Telephone ____

==SynOntic

SynOptics

MA9402A-SNW

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES
BUSINESS REPLY MAIL FIRST CLASS MAIL PERMIT NO. 150 JACKSONVILLE, FL POSTAGE WILL BE PAID BY ADDRESSEE SynOptics
SynOptics Communications, Inc. P.O. Box 45018 Jacksonville, FL 32232-9968

Our Token Ring hubs are fully compatible with the IBM™ blueprint.

Let's get to the core of the matter. You want to integrate LANs into your IBM/SNA environment, but you don't want to compromise the level of service your users expect.



a higher level of control.

No sweat. Our Token Ring solutions are 100% IBM-compatible. And our relationship with IBM allows all of our hubs-whether Token Ring, Ethernet or FDDI—to blend seamlessly into your legacy environment, creating one cohesive system.

Which shouldn't come as any surprise. SynOptics[™] is, after all, the

leading supplier of intelligent hub solutions. For complex enterprise networks, we offer the Lattis System 5000™ network center

Blue to I the core.

hub. When combined with new Optivity™network management software, the System 5000 lets you create and manage logical Token Ring networks. Optivity supports all leading management platforms, including IBM's NetView*/6000.

For departmental applications, our wiring closet hubs feature a new 3174 cluster controller module—built by IBM—for a smooth link into your existing IBM/SNA environment. And our family of workgroup hubs provides cost-effective connectivity and management for smaller networks.

So call 1-800-PRO-NTWK, ext. 22 to receive our "Blueprint for Structured Networking" planning kit. Because if you're looking for intelligent hub solutions, look to the ones that are blue through and through.



The Network Fabric of Computing



E S

by Mark Gibbs

Evolution vs. revolution: no, no, a thousand times, no

nother week on the road and I've had several very interesting conversations with network managers about things like connecting LANs with the Internet and upgrading to Net Ware 4.X.

A question that often comes up is should we move to these new technologies right now and do so wholesale?

Well I'm here to tell you no. No, no, a thousand times, no (as Victorian heroines were wont to cry).

By all means move toward new technologies, but don't go flat out. Why? Because there is little that is as dangerous as revolution. The history of failure is littered with those who would attempt revolu-

And when you apply a revolutionary methodology of bringing new products into a network environment, you are simply asking for trouble.

The reality is that few organizations can tolerate such upheavals. For a start, when you say to management, "OK guys, get ready to commit yourselves to this new structure," you'd better already have the chairman or some other corporate heavyweight on your side to make it happen.

RAMPANT POLITICS

It is a fact of life that most organizations suffer from rampant politics. This means that try-

> ing to get a consensus on how to deploy new technology is like herding cats.

> It is always the same. No sooner do you have a tentative structure than some bozo in senior management finds a reason why it won't

> You settle his hash, and, before you know it, another corporate poodle waltzes in on his hind legs and starts to yap about some other obscure yet, to him, terribly important organizational issue that only an masochist trying to escape a

hangover would be able to appreciate.

If you try to roll out any major changes in a short time, you're faced with several interesting (for want of a better word) challenges.

The first is that a major-scale rollout requires planning. Not just a little planning, but vast, intractable acres of hard thought and battles over turf that involve all of those who will be affected. That is, unless you can shield them from perceptible change. Good luck if you think you can do that.

Then there's the manpower problem. Any major changes are going to require warm bodies to keep an eye on the process even if it is automated to any significant degree.

Finally, there's the training problem. It is a rare product that won't require the users to undergo some sort of education to get the best

So the practical conclusion that only the criminally reckless would deny is that widespread rollouts of technically advanced products are dangerous, problematic, and even if they go well, time-consuming and, therefore, costly.

TAKING IT SLOW

So how do you take new technology onboard? Slowly, cautiously and, if you're wise, rather nervously.

And I'm not just talking about network operating systems or communications software. I'm talking about the whole panoply of applications that you might want to put on a network.

Hell, I've heard more horror stories about upgrading word processors than I've heard about LAN operating systems.

Why? Because they're more full of features than a pomegranate is full of pips, and assimilating a huge, new feature set is downright exhausting.

The fact is that revolutionary changes are dangerous. If you are looking to implement NetWare 4.X or connect your LAN to the Internet, there's only one rational course: Take it slowly.

The fact is that revolutionary changes are dangerous. If you're looking to implement **NetWare 4.X or** connect your LAN to the Internet, there's only one rational course: Take it slowly.

I recommend moving core services - one at a time — as the first step. Then migrate one or two evangelists.

You know the type. They're the techno-junkies.

They sit in the middle of the office, and, if you give them a new hardware or software toy, they start showing off its tricks to all and

sundry (give them Mosaic under Windows or on a Macintosh, and then watch them salivate).

Use that kind of strategy, and soon the whole office will be begging for access. After that, you'll get the kind of buy-in that you

What it all comes back to is selling. Sell MIS and its strategies to the organization, and you'll get what you want.

Force a revolution, and you'll have to fight all the way.

→ Gibbs is a consultant and writer based in Ventura, Calif. He can be reached at (805) 647-2307 or on the Internet at mgibbs@rain.org.

New Live Seminar via Satellite from PBS!

Internet: A Practical Approach

May 5, 1994 1-4 pm ET

The PBS Adult Learning Satellite Service, in cooperation with the Computer Television Network and the Data Processing Management Association, is pleased to present a live, interactive videoconference on navigating the world's largest computer network.

For information about attending or downlinking this videoconference.

Call 1-800-827-7990

or send e-mail to RLLAYMAN@NETCOM.COM



Ed Krol



Scott Yanoff

Ed Krol, author of The Whole Internet User's Guide and Catalog, and Scott Yanoff, compiler of two popular on-line Internet resource lists, will guide participants through a complete overview of the "network of networks" that is rapidly becoming the standard by which the information superhighway will be built. File transfer protocols, retrieval methods such as Archie and Gopher, and other topics will be covered, with plenty of time for hands-on exercises and call-in Q&A. If you want to understand better what's available on the Internet and how you can use it, don't miss this videoconference!

PRODUCED BY:

IN COOPERATION WITH:

PRESENTED BY:

PROMOTIONAL SPONSOR:

INTERNET ACCESS PROVIDED BY:

The Association of Information **Systems Professionals**

DPMA

\$\PBS ADULT LEARNINGSATELLITE SERVICE



FIFTEEN TIMES THE BANDWIDTH. HALF THE PRICE.



ANY QUESTIONS?

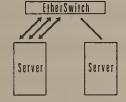
INTRODUCING THE KALPANA RACKABLE, STACKABLE 15-PORT ETHERSWITCH.®

You plug it in, you get an immediate performance boost. A *big* boost.

Without taking a big hit in the budget, or writing off the investment you've already made in hubs, servers and wiring. Start with our

price per port of about \$500, factor in the number of users you can hook up to every one of those





Plug in an EtherSwitch for big performance boosts in stackable and multi-segment bubs or server clusters. switched 10Base-T ports, and you wind up with, unquestionably, the most cost-effective answer to your performance problems.

And you're getting a plug-and-play solution that adds bandwidth without adding complexity or administrative overhead.

Low profile, 1.75" high rack-n-stack packaging lets you grow it when and where you need it.

Even cascading 60 switched ports, a stack still fits just about anywhere.

And with the EtherSwitch's on-the-fly packet switching, you're getting the lowest latency in



the industry* for the whole stack. Without question.

With new features like 802.1d Spanning Tree

Protocol, address filtering, downloadable code and Virtual EtherSwitch

LANs, you can use our newest EtherSwitch in more ways than ever.

Interconnect multiple hubs. Or connect your servers, using our full duplex capability to more than double the throughput increase.

Instead of rolling the dice on a new infrastructure, get the higher bandwidth you want now

with what you already have in place. More bandwidth, in fact, than you can get with higher-speed shared technologies.

That's why IBM, Sun, HP and Synoptics have made the move to Kalpana EtherSwitch technology. And that's why, without question,

✓ 802.td Spanning Tree Protocol
 ✓ Address Filtering
 ✓ Downloadable Code
 ✓ Virtual EtherSwitch LANs
 ✓ Full Duplex
 ✓ EtherChannel

Call 800-488-0775 for a Try'n Buy evaluation unit, or an animated disk that will help you

we've sold more switched Ethernet ports than all other Ethernet switch vendors combined.

evaluate Ethernet switching. For an immediate FAX-back response, call (408)749-1900, extension FAX, and select document number 203.



Innovative. Leading-edge. Completely foolproof. These may not be the first words that come to mind about Token Ring networks.

But now they can be.

Just look for the products that come with three

letters—no, not those three letters, these three letters: 3Com.®

3Com's Token Ring solution for the workgroup — including adapters, hubs, and management — improves the performance of your Token Ring network with a series of technological innovations found only with 3Com.

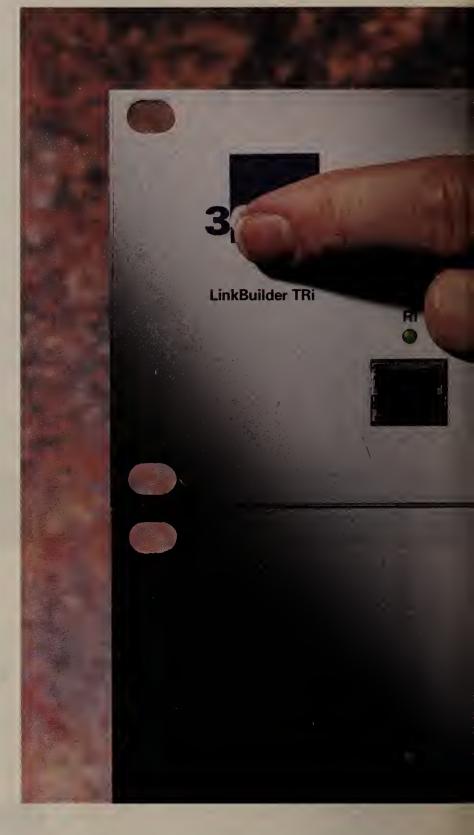
The innovation starts with full network management capabilities for all 3Com TokenLink® III adapters and LinkBuilder®TR Series stackable hubs.

Only 3Com offers fully-implemented RMON for a network analyzer level of management for its Token Ring hubs, providing in-depth trouble-shooting tools such as alarms, historical error and traffic analysis, and packet

capture with advanced filtering capabilities, among others. No other Token Ring hub offers greater troubleshooting capabilities than 3Com's LinkBuilder TR Series hubs.

Add 3Com adapter management and you can manage down to the desktop to identify and isolate errors on your network, track hardware, and even generate graphical reports.

What's more, 3Com's Phased-Locked Loop technology allows you to carry more robust signals over longer distances with new or existing wires, and will support up to 256 users per ring. And be-



fou'll find the be other from a compa

Just not the

cause you can carry clear signals over lower grades of wiring, complete re-wiring of the building is unnecessary.

3Com's LinkBuilder TR Series hubs even prevent network downtime by locking out faulty users *before* access is gained to the network.

Couple this with the highest-performing, 100 percent IBM®-compatible TokenLink III adapter

The best performing Token Ring adapter at a price you never thought possible.



TRY 3COM'S NEW TOKENLINK III ADAPTER FOR JUST

\$199

Our new TokenLink® III ISA adapter offers incredible ease-of-use with AutoLink,™ 3Com's auto-installation software. And now, for a limited time, TokenLink III ISA is available with Transcend™ TokenLink SmartAgent™ network management for only \$199.* That's more than 75% off the list price of the two products.

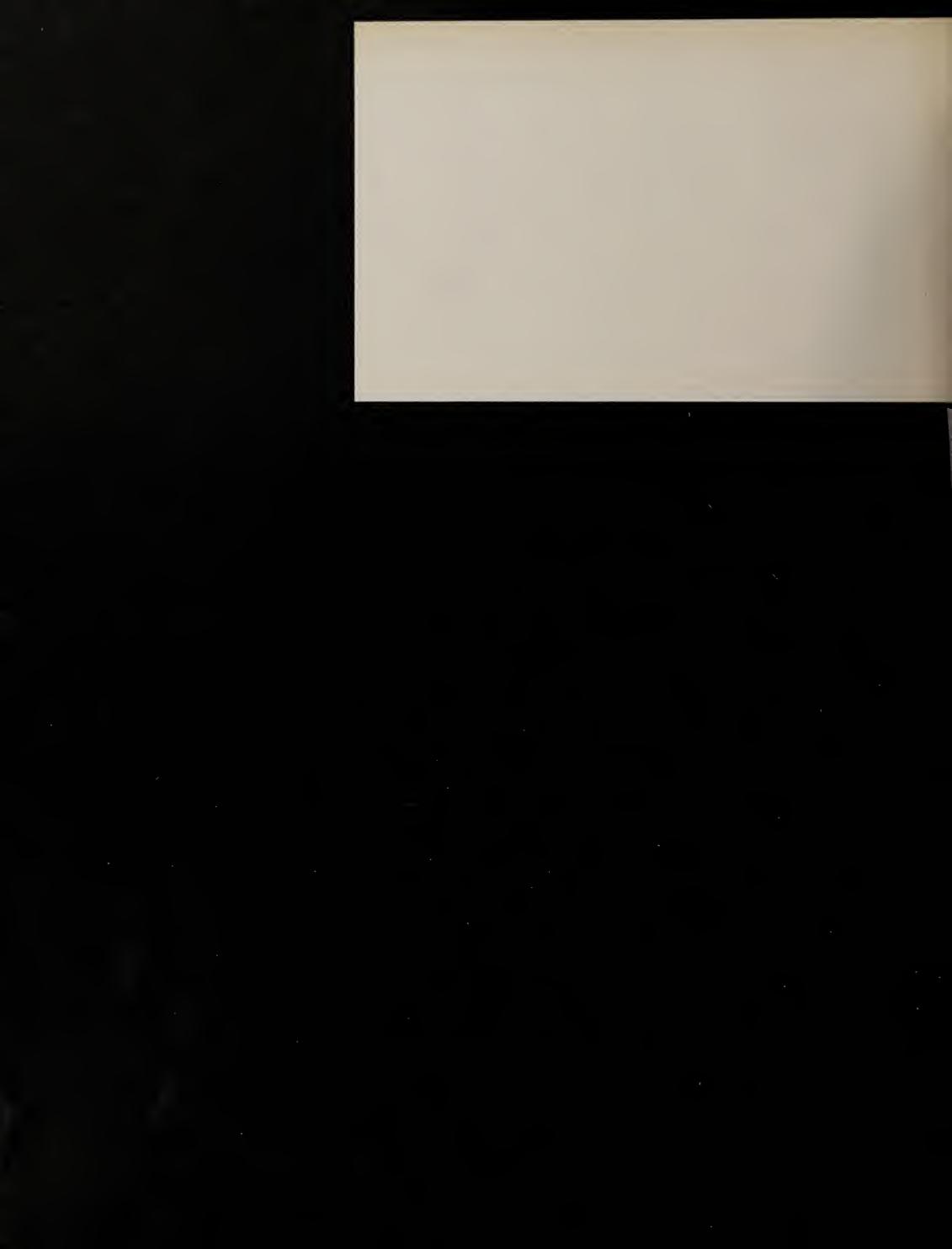
Now you can configure your adapter and install your NetWare® client files in under three minutes. Get network management down to the desktop. Plus 100% IBM® compatibility.

To get your \$199 TokenLink III ISA evaluation kit, plus a LANQuest Labs ease-of-use-benchmark report call **1-800-NET-3Com**.



Networks That Go the Distance™

*Offer expires June 15, 1994. Limit one to a customer, while quantities last. ©1994 3Com Corp. 3Com, TokenLink, Transcend, AutoLink and Networks That Go the Distance are trademarks of 3Com Corp. All other trademarks are property of their respective owners.





st Token Ring performance ny with just three letters. three you're thinking of.

family that comes with a money-back guarantee for compatibility and a lifetime warranty, and you get a measure of performance found in no other Token Ring product line. And that's just for starters.

But why not see for yourself? Just call us at 1-800-NET-3Com for complete information on our specially priced Token Ring Bundle for the workgroup, and 3Com's full line of Token

Ring adapters, hubs, network management and bridge/routers. And learn why there's another three-letter choice for your Token Ring network.



Networks That Go the Distance



That's why twice as many customers choose AT&T Data Communications Services over any other carrier.

AT&T BUSINESS ADVANTAGE Being a leader isn't just about doing it first. It's about doing it right, time after time. That's

why more businesses trust AT&T with their data networks than anyone else. And that says a lot about the way we run our business.

You can check it out yourself. For three years, customers picked AT&T first for quality and reliability in *Data Communications*' reader surveys. A vote of confidence that's been repeated in surveys in *Network World* and *Computerworld*.

Of course, being the leader is a responsibility we take rather seriously. To AT&T that means providing reliability that's second to none. And the broadest selection of domestic and international data services anywhere. From ACCUNET® private line data services to InterSpan® Services offering packet, frame relay and ATM. That's why with AT&T you can be sure your data will get where it's needed, when it's needed.

The proof of AT&T's leadership is clearly visible in our experience designing the right data networks for business. So, it follows that our technical experts will use the most advanced design tools to see that you get the best solution for your network. A promise

that's easy to keep when you have the resources of AT&T Bell Labs behind you.

To make sure your data network always earns high marks, do what more businesses do. Check out the leader. AT&T. To find out more about all our reliable data services, contact your AT&T Account Executive. Or call 1 800 248-3632.



GLOBAL SERVICES

Voice, Data and Wireless Services, Regulatory Issues and Voice CPE

Anticipating next year's adoption of the new North American Numbering Plan, the North **American Telecommunications Association** (NATA) has come out with a guide to changes users can expect with the new plan. Potential problems for users include difficulty in reaching parts of the country with new numbering schemes and potential losses in system capabilities for least-cost routing and restricting toll calls. "The North American Numbering Plan: A Guide to Preparing for New Number Formats" can be obtained for \$25.

NATA: (800) 538 6282, Ext. 260.

BellSouth Corp. last week annouced plans to bid on a nationwide narrowband personal communications service (PCS) license in the upcoming Federal Communications Commission PCS spectrum auctions. BellSouth's Mobile-Comm paging subsidiary hopes to use the spectrum for high-speed messaging services such as acknowledgment paging, which would allow a subscriber to acknowledge when a page is received. For the auctions, MobileComm is considering partnering with other firms to bid on one of the 11 nationwide licenses the FCC is expected to put on the block later this year.

The Switched Digital Services Applications Forum has decided that Bell Communications Re**search** — now an Integrated Services Digital Network services database proprietor — could be biased against switched 56 services and, thus, might not be the best choice to run a combined ISDN and switched 56 services database the forum plans to sponsor. The forum hopes to have a decision on a service vendor by summer and the database on-line by November.

MFS Intelenet, Inc. in Parsippany, N.J., has activated two blocks of 10,000 telephone numbers in New York's 212 area code. The move implements a recent ruling by New York state authorities forcing NYNEX Corp. to relinquish control over certain phone numbers to competitive access providers, now known as "cocarriers." As a result, incoming calls to MFS Intelenet customers using these numbers will no longer have to pass through NYNEX switches. MFS Intelenet is the subsidiary of MFS Communications Company, Inc. that integrates local and long-distance service for small and midsize businesses.

Cherry Communications, Inc. in Westchester, Ill., has entered into a consent decree with the Federal Communications Commission under which it will make a \$500,000 "contribution" to the U.S. Treasury. The reason: The FCC received complaints that Cherry had named itself customers' primary interexchange carrier (PIC) without the customers' OK — a practice known as "slamming." From now on, Cherry must not change any customers' PIC codes until it has first obtained a letter of authorization from the customer. Plus it must have all authorizations verified by an agent of Cherry who will obtain the customer's oral go-ahead.

Fax transmission costs run rampant

Sloppy management causing firms to leak unnecessary millions, surveys find.

BY JOANIE WEXLER

Stratford, Conn.

While large companies are making strides toward getting a centralized grip on

their networking re-The Almighty sources and expenses, many are overlooking a large-ticket item: facsimile transmission costs.

The willy-nilly management of fax networks is causing a hidden bleeding of corporate coffers, according to surveys con-

ducted by The Gallup Organization for Pitney Bowes, Inc.'s Facsimile Division, located here.

The results, made public last week, reveal a general lack of fax usage monitoring, a dearth of policies for containing costs and inadequate fax operator knowledge about cost-saving features designed into the equip-

A 1994 Gallup survey of 150 Fortune 500 telecommunications managers indicated that about 36% of all telephone expenses are fax-related, with a 9% increase expected during the next year.

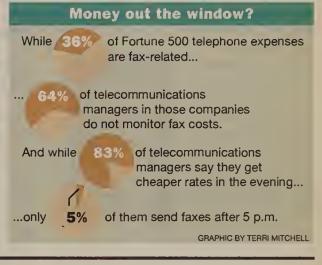
However, 70% of Fortune 500 companies

have no policies for using their fax equipment in ways that manage costs and minimize unproductive usage, according to a three-year Gallup study tracking 400 Fortune 500 companies each year. Only about 36% monitor usage at all (see

This state of affairs sounds reminiscent of the history of the localarea network: "We think that a huge number of de facto fax networks are being plopped into departments using a decentralized commodity purchasing approach that ignores long-term cost implications," said Kathleen Mufson, director of program development at the Pitney Bowes fax divi-

This situation is in evidence at the American Cancer Society: "We don't have a fax policy per se, other than requiring a supervi-

See Fax costs, page 32



Post-it Notes maker forges ahead with SMDS plans

BY JOANIE WEXLER

regional Switched Multimegabit Data Services (SMDS) network, but it needs carrier cooperation to piece together the nationwide

Prior to last week, 3M ran US West, Inc.

SMDS links from its St. Paul data center to two metropolitan-area sites: one running an imaging-heavy accounts payable application and another generating bandwidth-intensive computer-aided design (CAD) traffic.

Now the company has added a second accounts payable site and will add a fourth SMDS node to handle orderentry traffic in mid-May, said Ioe Bumblis, lead analyst within 3M's information technology group.

The company plans to detail the moves at the International Communications Association conference, which will be held

SMDS is an Asynchronous

switched broadband connections. Its reputation suffers from a paucity of carrier backers and intercarrier network connections.

However, on a local basis, SMDS is serving companies such as 3M well for applica-

tions where frame relay is too slow and fullblown ATM too immature.

In 3M's case, saturated T-1 links are forcing the company to turn to the SMDS net, which runs at 4M bit/sec. Alternatives, Bumblis said, included T-3 or multiple T-1 links, which were more expensive than SMDS. Another option, frame relay, maxes

> out at T-1 rates. "This didn't seem to offer enough of a performance benefit to be worthwhile," he said.

Meanwhile, ATM still has unresolved issues such as not allowing inband management, he said.

3M's order-entry cutover initially involves only the St. Paul sales center due to the lack of local-to-long-distance SMDS links based on the Inter-Carrier Interface (ICI). The ICI would allow local carriers such as US West to link their SMDS networks with long-distance SMDS services.

Only MCI Communications Corp. and PACKETS, a Sacramento, Calif., start-up, offer interexchange SMDS.

The ICI specification became final in March 1993. Next week, Pacific Bell, GTE Telephone Operations, Bell Atlantic Corp., MCI and PACKETS will demonstrate ICI interoperability at the Networld + Interop 94 trade show in Las Vegas, said Dick Shi-

mizu, chairman of the National SMDS Inter-Carrier Interface Consortium, which is charged with testing and deploying ICI.

Bumblis needs ICI availability now; sales centers all over the country send pricing, order status and inventory information to the St. Paul data center. 3M's highest traffic sales sites in Atlanta, Chicago, Los Angeles and New York would be key candidates for the SMDS net, Bumblis said.

3M also needs the ICI so it can link its data center to a 3M manufacturing site in Austin, Texas, which currently hooks in via dual T-1s.

Southwestern Bell Corp., the local provider in the Austin area, does not provide SMDS service, which could be bad news for 3M. However, GTE is looking at implementing ICI in "every major market this year or next," said Arnie Eizensmits, GTE SMDS product manager.

3M's local carrier, US West, will support ICI when it is available from its switch vendor, depending on price, said product manager Sheila Waltz.

In the meantime, 3M has configured its metropolitan SMDS network like a large local-area network. This configuration is also known as ATM Adaptation Layer 3/4, or "connectionless" ATM. SMDS can also be configured as a mesh network of permanent virtual links.

The LAN-like option, though, allows 3M to conserve Internet Protocol subnet addresses in an era when the addresses are becoming scarce.

"If you use point-to-point links, you need a unique IP address at each router that connects to the WAN," Bumblis explained. This SMDS configuration, "which is like one big metropolitan Ethernet," requires just one IP subnet for the whole network, he said. Z

Why SMDS?

▶ Runs at speeds

faster than T-1,

▶ Is less expensive

or T-3 links.

than multiple T-1

► Allows for inband

management, unlike ATM.

Conserves IP

subnet addresses.

unlike frame relay

St. Paul, Minn.

3M Corp. is on a roll with expanding its SMDS net it really needs.

next month in Dallas.

Transfer Mode (ATM) service that provides

CENTER MGMT.

by James Kobielus

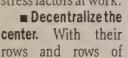
Avoiding the high-tech sweatshop syndrome

he inbound/outbound call center has become the sweatshop of the modern corporation, handling such essential functions as telemarketing, order entry, customer service, help desk, claims processing and bill collection. The average call center rapidly burns out telephone operators through nonstop, repetitive, deadend work. Employees are continually monitored and pushed for greater performance.

We can't rid the world of high-volume calling operations. But we can make call centers a more humane work environment through enlightened management labor practices sup-

ported by smarter applications of telecommunications and information systems.

Network managers should redesign call center operations following guidelines, which address the principal stress factors at work:



operators sitting at video display terminals in high-walled cubicles, call centers are a forbidding, factory-like entity. However, there may be no need for concentrating so many personnel at one location, since automated call distributors may be set up to route incoming calls to office, home or mobile telephones and computers. Telecommuting is becoming an increasingly feasible option for call center operators, thanks to the increasing availability of Integrated Services Digital Network lines, which can carry voice and data channels over a single twisted-pair telephone line.

■ Automate the grunt work. Operators can get fatigued when forced to handle a steady stream of routine informational inquiries, such as "What's today's rate?" or "What's my balance?" Free up your operators to deal with more complex, less well-structured inquiries by delivering routine information through interactive voice response, fax response and computer bulletin boards. Your customers will prefer the speed and efficiency of electronic information delivery.

■ Empower operators with information and access. The most difficult calls to handle are those in which the operator knows nothing about the calling or called party and has to ask for basic information (for example, name, address or account number) before getting down to business. Provide operators with as much advance information on the caller as possible. Use caller identification, where avail-

able, as the key for integrating your company's telephone switches and computer systems so current database records can be flashed on operators' computer screens when the call is connected. Allow operators to share the voice call and data screen with managers and technical experts, thereby resolving customer ques-

tions and concerns in one session. ■ Eliminate unannounced monitoring. Distrust is a social poison and a principal cause of

office stress, absenteeism and turnover. The quickest way to show your workers that you don't trust them is to engage in unannounced performance monitoring. Call center managers should eliminate unannounced monitoring of operators' phone conversations, keystrokes and other activities.

On-line performance monitoring may be necessary to ensure service quality, but workers should be notified by beep tones and other

Anyone who doubts the stressfulness of call center operations should put on a headset and plunk themselves down before a glowing video display terminal. Operators have very little control over the pace of work, which depends on the unpredictable ebb and flow of incoming calls or the rapid-fire algorithms of an autodi-

Lack of a career path and isolation from the corporate mainstream compound the frustration felt by call center personnel.

Working the phones will never be tops on anybody's list of plum jobs, but it need not be hell on earth either. In designing call centers, telecommunications professionals should place as much importance on the mental hygiene of the operators as the physical configuration of the facility and its networks.

> → Kobielus, a contributing editor to Network World, is a senior telecommunications analyst with Alexandria, Va.-based Dyn Network Management, Inc. He can be reached at (703) 922-6829.

Kobielus is filling in for Eric Paulak, the regular columnist in this section, who is on vacation.

Fax costs

Continued from page 31

sor's sign-off on any fax longer than 10 pages," said Jerry Noble, director of telecommunica-

However, the organization is on the brink of removing dedicated voice lines for fax and hooking its 16 fax machines at national headquarters into the corporate private branch exchange, which connects to a VMX, Inc. voice processing system.

The VMX software will track how much transmission time is actually being taken up by faxes, Noble said, and help the organization determine its fax expense status. Currently, Noble said, the American Cancer Society doesn't really have a way to track how much money there is to be saved via tighter fax management.

The organization uses a hodge-podge of fax machines from different vendors. "Some of them have monitoring software built-in, but most of them don't," he said.

At The Travelers Insurance Co. in Hartford, Conn., a homegrown application on the corporate host tracks usage by telephone number and charges back the various departments accordingly. This leaves cost containment measures up to the individual departments footing the bills, said John Murphy, director of telecommunications.

"I'm not going to sit here at headquarters and dictate what fax costs should be," Murphy said.

One impediment to centralized management, he said, is that voice and fax lines at dispersed sites are swapped continually and a phone number originally registered as a fax line could wind up a voice line and vice versa. While the central telecommunications organization wouldn't be able to distinguish a fax line from a phone line, the departments reviewing their bills know which lines are which, he said.

Mufson said the three-year Gallup study indicated that the average Fortune 500 company spends \$3.5 million to \$5 million per year on fax transmissions. "If you could delay a fourth of your transmissions until after 5 p.m., you could cut costs by 9%" because of off-peak telephone service rates, she said.

This would equal \$315,000 to \$450,000 per

year in savings.

"If you could delay a fourth of your transmissions until after 5 p.m., you could cut costs by 9%," because of off-peak telephone service rates.

In addition, she suggested that users sending a five-page document via 14.4K bit/sec rather than 9.6K bits/sec links could cut individual transmission costs by two-thirds by reducing net connection time.

Noble pointed out, though, that the savings would

be offset by some up-front capital investments in the faster equipment.

Mufson said fax audits that Pitney Bowes has conducted for customers reveal such costsaving measures have saved users \$50,000 to \$1 million in annual transmission fees.

Mufson also suggested companies consider piggybacking fax traffic over their existing data networks because, according to the three-year study, 55% of all Fortune 500 fax traffic is sent from one company location to another within the same corporation.

However, only 20% of Fortune 500 companies run fax over their existing lines, while 60% of the survey respondents said they had spare

capacity on their networks.

Noble's organization, in fact, is planning to plunk its intracompany fax traffic on its Hughes Network Systems, Inc. very small aperture terminal net. Hughes is on the brink of offering Group 3 fax support on the network,

Comments?

See "Contacts" box on page 2.

CONNECT ALL THIS



ATM Forum moves ahead on service standards

BY BILL BURCH

The ATM Forum has made progress on standards for signaling and frame relay interoperability, but faces tough work ahead on congestion control and the network-to-network interface, according to forum president Fred Sammartino.

Speaking at the recent ATM: Year Two conference here, Sammartino detailed where the group stands with standards that ensure interoperability between Asynchronous Transfer Mode services, allowing users to smoothly connect networks across carriers.

For users, the key standard is probably interoperability between ATM and frame relay. The forum has approved an interoperability standard, and the Frame Relay Forum is currently balloting its members. Results will be announced next week at the NetWorld + Interop 94 conference in Las Vegas.

That standard would cover a number of networking scenarios, including frame relay transport over an ATM backbone and interoperability, which would allow a frame relay user to connect to an ATM user.

Among national carriers, Sprint Corp. and WilTel have been ATM service pioneers. The two have focused on bearer services, as opposed to value-added services such as protocol conversion between ATM and frame relay.

At WilTel, tests of a proprietary implementation of a frame relay-to-ATM service are under way, according to Robert Decker, Wil-Tel's ATM services director. But the carrier is holding off on general service availability until a standard is in place, he said.

The forum is also working on a standard network-to-network interface that would let carriers survey an ATM link down to the user's

Now you can connect all

networking software from Brixton Systems.

Brixton's gateways and emulators let you

So you can move easily to open systems,

ink Unix to AS/400s and mainframes. PCs to your

servers and hosts. Even 3270 terminals to Unix

your Unix and PC users with all

your SNA hosts and users. With

while you protect your investment

applications.

n legacy equipment

ind applications.

premises. Work has been completed on the interface's physical layer specification, but the forum must now tackle the harder problem of standardizing signaling and routing in the wide area, Sammartino said.

The toughest nut for the forum to crack may be traffic management, a problem that has been with ATM since its inception.

"We're starting to tackle the harder problems of congestion control," Sammartino said.

A draft recommendation, or perhaps just a framework to approach the problem, will be ready by year's end, he said.

As for switched virtual circuits, the forum has completed work on the Q.93B signaling standard, but vendor support and carrier offerings appear further off. For example, MCI Communications Corp. does not foresee carri-

ATM Forum progress update

Frame relay interworking

- Lets users send frames over ATM.
 Ratified by ATM Forum; awaits Frame Relay Forum approval.
- Supports LAN emulation and switched services.
- Basic specification (Q.93B) is complete.

Traffic management

- Allows control of network congestion.
- First revision is complete; draft recommendation is due by year end.

Network-to-network interface

- Lets carriers share network management
- ▶ Physical-layer standard is finished; work has begun on signaling and routing.

ers offering switched virtual circuits for ATM until next year, according to David McDyson, a member of MCI's executive staff.

After the technical hurdles, carriers must still figure out what demand for switched ATM will be. Dial-up broadband connections have always been one of ATM's selling points, but service demand at various price points has yet to be tested, said Lawrence Gasman, an analyst with Communications Industry Researchers, Inc. in Charlottesville, Va. Z

Schools take high-speed road

Baltimore starts Info Superhighway journey with ISDN lines.

BY DAVID ROHDE

Baltimore

Just when the nation's schools started becoming targets of data highway hype, all of this city's schools quietly wired themselves up for the high-speed future.

Last year, the Baltimore public school system installed Integrated Services Digital Network lines in almost 190 schools, making it one of the largest metropolitan-area ISDN networks in the nation.

But no teary-eyed visions of a high-tech education future drove the project — at least at

Rather, a consent decree resulting from complaints by parents of special-education students forced the school district to make sure it kept its student records up-to-date.

'Under the federal guidelines, there were special-education services we had to provide," said Terry Laster, director of management information services for the school district. "And there were no means to determine what level of compliance we were in."

The only remedy was to give individual schools the ability to maintain student records themselves and empower principals to make decisions under a concept called the Enterprise School, Laster said.

So the school district established a seamless citywide internet using the two 64K bit/sec channels provided by ISDN Basic Rate Interface (BRI) lines.

At each school, an ISDN BRI line hooks into a Novell, Inc. NetWare file server containing a PC IMAC ISDN local net adapter from the DigiBoard division of Digi International, Inc. in Eden Prairie, Minn. The server supports three to seven workstations and one or two printers.

At the school system's headquarters, eight 80486-based personal computers act as routers, each containing four multiport PC IMAC/4 ISDN adapters plus routing software from DigiBoard. The routers support Novell's Internetwork Packet Exchange (IPX) protocol, enabling users at the remote school locations to access office automation applications and databases residing in 10 servers at the school system's headquarters.

But the real heart of the school district's records — including the critical special education database - still resides in the old mainframe, which now acts as yet another server on the network.

To get at this data, the IPX traffic passes through two Novell NetWare for SAA gateways sitting on token-ring networks at the headquarters, then passes through two 3174 cluster controllers linked to the mainframe.

In that fashion, the district's student management, human resources, food service, facilities management and finance programs are supported by the ISDN network.

The next step is moving beyond administrative programs to educational applications.

The school system is using the ISDN links to establish dial-up links from school libraries into the city's main public library, the Pratt Library. To get into the Pratt Library's InforNet

ISDN goes to the library

These are the 15 InforNet services provided by the Pratt Library to 190 school libraries in Baltimore over ISDN BRIs:

- Art index
- Bible library
- Book/periodical indexes
- Census data
- Computer journals
- Educational resources
- Government documents Health reference center
- Magazine article summaries
- National trade databank
- Newspaper abstracts
- Periodical abstracts
- Peterson's college guide
- Physician's desk reference
- Social science index

services - including 15 different reference tools (see graphic) — students previously used 2,400 bit/sec modems.

Just last week, the library installed an ISDN bridge using two DigiBoard PC IMACs to inverse-multiplex the two B channels on each of two BRIs. The resulting 256K bit/sec link should allow multiple users into the Pratt Library's resources at any given time, said Chuck Cavolo, executive vice president of Consolidated Computer Investors, Inc. (CCI) in Hanover, Md.

CCI is the systems integrator and valueadded reseller that installed the entire network atter its \$4.98 million bid won out over five competitors' pricing.

The CCI installation replaced the school district's old multipoint analog leased-line net. Running primarily at 4.8K bit/sec, the network tied a single 80286-based PC at each school with an IBM 4381 mainframe at headquarters.

Under that setup, all 190 schools were outof-luck "everytime the host burped," Laster said. That kind of system could not handle the need to allow distributed processing, he said.

"All the functions that we were essentially managing for the schools, the schools now have to be able to do themselves," Laster added. Z

IBM Mainframe IBM Midrange

Leaders in software connectivity. Brixton offers the most complete connectivity solution in the

industry. And Brixton's products work entirely in software, so you're not tied to specific hardware. You build on your existing resources, and you keep your future hardware options completely open.

Find out why nearly 100 of the Fortune 500 are connecting with Brixton. Call today. We have

the connections to make net-

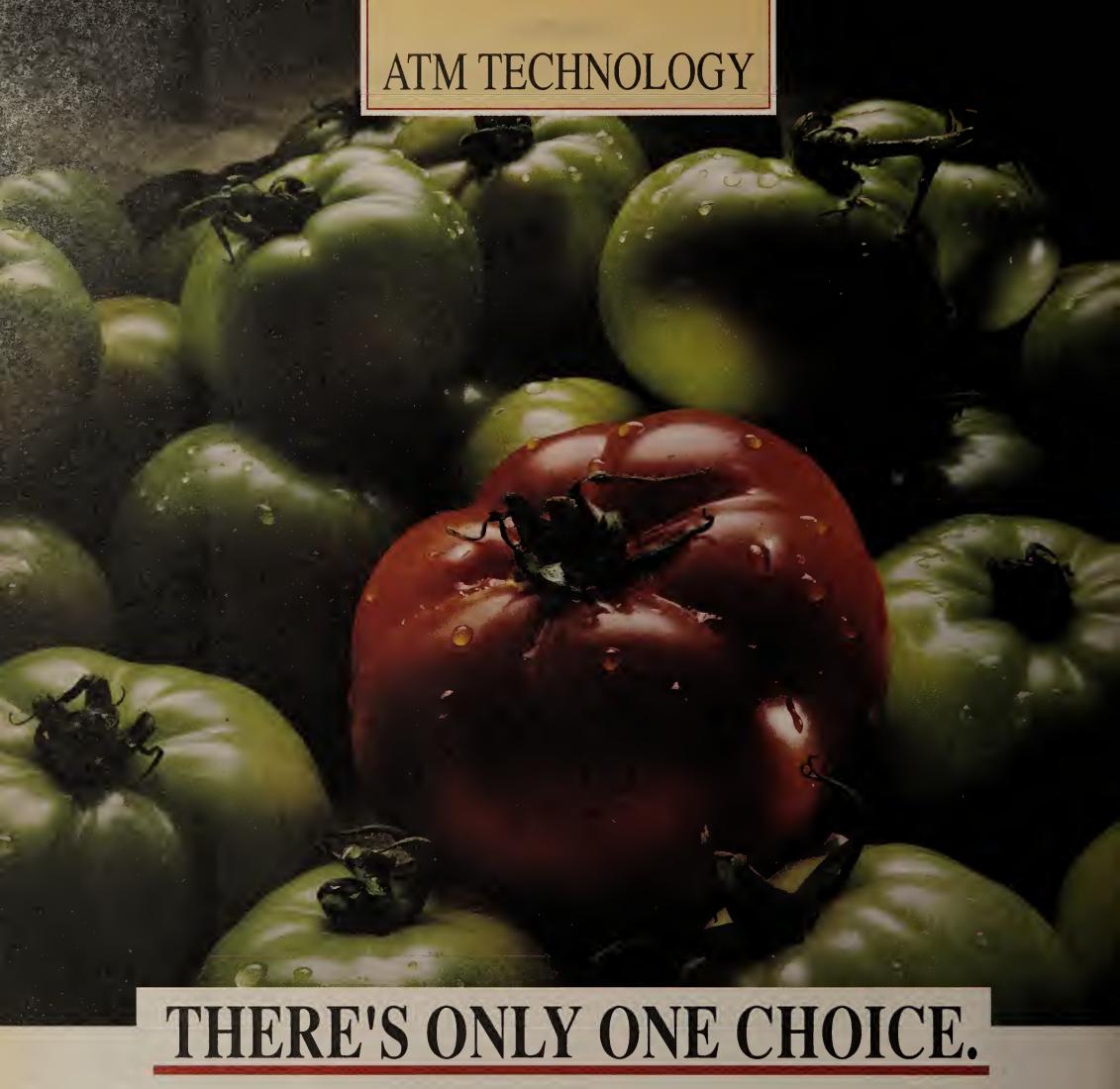
working easy.

CONNECT WITH US.

1-800-BRIXTO

All trademarks are the property

Brixton Systems, Inc., 125 Cambridge Park Drive, Cambridge, MA 02140 USA



One ATM switch on the market today has the features and performance to be a good pick for your network. Only the GDC APEX ATM switch delivers fully seasoned ATM capabilities right now. It offers a 6.4 Gbps internal architecture; provides worldwide interfaces such as



T1, T3, E1, E2, E3, RS449, HSSI, TAXI, OC-3c, and Ethernet; furnishes full capabilities for integral frame relay switching as well as voice, data, image, video, and fax; and supports both PVC and SVC, as well as industry-standard SNMP network management. To experience the full flavor of ATM in your corporate network, call today, +1-203-792-0542. We'll

send you more information on ATM and on GDC's unique network architecture. In North America, call toll-free at 1-800-777-4005.



WORLD CLASS inter NETWORKING

white paper



Bringing Client/Server Computing to the Enterprise

Key Issues Facing IT Today

he rate of change in the information technology industry never seems to slow down, and Network IS professionals are constantly faced with the issue of how to keep up-to-date with technology changes and how to exploit those changes to enable their organizations to be more cost-effective and remain competitive in today's business climate.

During the past 20 years, most IS professionals have concentrated on building operational systems that support ongoing day-to-day business activities. These systems include high-volume on-line transaction processing applications such as automated teller machines, line-of-business applications such as order entry, and interactive applications such as human resource systems. Today Network IS professionals are under pressure to reduce the cost of developing and maintaining these operational systems and to add new information systems that allow business end users, or knowledge workers, to use the information stored in operational systems to compete more effectively in the marketplace.

The technology that many are pinning their hopes on to satisfy the need to reduce system costs and to provide end users with better access to information is client/server computing. The problem is that client/server has become a muchabused buzzword that means different things to different people, and we have to be very clear about what we mean when we use the term.

Essentially, a client/server system consists of three main components:

- A **client** application, which interacts with the end user and accesses remote resources managed by a server.
- A **server** that processes requests issued by clients. Servers are typically either database servers that manage data resources and process client data requests, or application servers that manage applications and process requests from clients for application processing.
- **Middleware** that provides the software connection between clients and servers.

The Client

The main benefit of the client component is that it enables application processing to be distributed to desktop computers and workstations, allowing the exploitation of graphical user interfaces (GUIs) that improve end-user productivity and reduce errors when performing tasks such as data entry. Two key issues here are the design of the GUI and the tools used to develop the client application.

Although GUIs improve end-user productivity, they are complex to develop and require developers to learn new skills. GUIs require the developer to understand object/action processing, mouse/keyboard interaction, the correct use of color and fonts, and so forth.

There are literally dozens of products on the market for building client applications that employ GUIs, but many are only suitable for developing small-scale applications. Most client/server applications to date have been built by small teams of developers and operate in a departmental setting where client applications access data managed by a departmental or workgroup database server. Such applications do not usually have high-performance requirements in that they do not have to process hundreds of transactions per second or support hundreds of users. These applications are typically built using integrated GUI/fourth-generation language (4GL) products (sometimes called visual programming tools) such as Gupta Corp.'s SQLWindows, Microsoft Visual Basic and Powersoft PowerBuilder. There is also considerable interest — because of the potential for code reusability — in objectoriented client/server development tools such as IBM Visual Age and Digitalk Inc.'s PARTS and Smalltalk/V. Such tools, although very powerful, require major reeducation of existing developers, who are accustomed to creating monolithic COBOL applications.

For client/server to succeed, however, its use must be extended to support enterprise-level applications that support hundreds of users and high transaction rates, and in situations where data can be stored on multiple servers.

Enterprise client/server computing raises a whole new set of issues:





- These applications involve larger development teams, and, therefore, require group development facilities such as a repository (to share GUI templates, code fragments, business rules, and such), shared program libraries with change control facilities, interactive testing and debugging tools, and so forth.
- Enterprise-level applications have higher performance requirements and may involve client-to-server interaction across slower wide-area networks. The solution is to move part of the application processing back onto the server and have the client application interact with an application server rather than a database server. Client-to-server requests are then done at a business transaction level rather than at a database request level. This improves performance since network interaction is reduced, and enhances data independence because client applications do not have to know about the format of the databases accessed by the remote application server.

This type of processing requires a whole new breed of application development tool. Such tools need to support, for example, the partitioning of application processing between the client and the server. The performance of the application server component becomes very important, and interpretive 4GLs may not provide adequate performance. This is why the server component is often written in a 3GL and why some vendors such as Dynasty and Forte are now developing visual programming tools that generate 3GL code.

 Enterprise-level applications may also need to be integrated or interoperate with existing corporate applications. Another benefit of the application server approach mentioned above is that it can be used to access data stored not only on the application server to which the client is connected, but also other servers. Such access is transparent to the client component of the application. Often in this type of application environment, a distributed transaction manager (IBM's CICS, NCR Corp.'s Top End, Transarc Corp.'s Encina, Unix Systems Laboratories, Inc.'s Tuxedo) is used to handle the integrity of multiserver update operations. Transaction managers also have the benefit of being able to handle a large number of concurrent connections by client applications.

• Running client applications on hundreds, possibly thousands, of desktop systems raises the issue of change control. How do organizations control the distribution of application and system software to these systems, ensure the updates got there and are in a position to cut over the release of the software at a specific time? So far, many organizations — for example, Bank of America and The Travelers Corp. — that have built enterprise client/server applications have had to develop their own software distribution systems. Frequently, distribution of new client application code is done at the server level (not the client level), and client applications are started each time by loading programs from the server at execution time. Today, numerous software companies are attempting to solve this problem, and solutions are beginning to appear on the market.

The Server

As we have already seen, there are two basic types of server: database servers and application servers. Database servers maintain either operational data or informational data and are typically accessed by client applications issuing requests — for example, SQL statements — for data.

Most operational systems maintain data on database servers in the form of numbers and letters, but there is increasing need to support more complex data such as voice, video, images, text and maps. Such support requires enhancements to data access languages, language optimizers, concurrency and recovery schemes, and so forth. Storing such data also requires large amounts of external storage, which is why CD-ROM devices and hardware-based compression will become very important. Good compression algorithms will also become important in reducing the network load when accessing this type of data from client applications.

The advent of client/server computing has enabled the development of applications that take operational data and turn it into informational data for business end users. Sometimes this is done by end users employing data access tools that interoperate directly with operational databases, but there is an increasing trend to copy operational data into a data warehouse, then provide end users with access to that warehouse. Copying data into a warehouse allows data to be integrated from a

Gentlemen, start your snails.

PC Magazine independently defined and ran a battery of real-world performance tests to compare database server software. PC Magazine states, "Oracle7 was the hands down winner on our performance tests, outperforming the others by a wide margin."



Just to be fair, here's what PC Magazine had to say about the other guys:

Informix OnLine "Only after days and days of repeated crashes were we able to obtain a full set of results." Ingres Server "...we would not recommend it because of the showstopping multi-user bug we encountered." Gupta SQLBase "...took an unthinkable 60 hours to load the tables and then crashed on the index builds..."

For your copy of the complete PC Magazine article, including test results call 1-800-633-0573 Ext.3729.



© 1993 Oracle Corporation.

multitude of sources and permits it to be cleaned, enhanced and reformatted along business lines. The key issue here is selecting the right tools to deliver the data to the warehouse and document it. New data delivery tools, such as Prism Solutions, Inc.'s Warehouse Manager and IBM's Data Propagator Relational and DataGuide products show vendor directions in this area.

A recent study conducted by DataBase Associates shows that a data warehouse is often one of the first client/server applications implemented by many organizations. The study also finds that the key business areas addressed by such a data warehouse is usually marketing, sales and financial data.

One of the key benefits of client/server technology is the scalability of the hardware platforms being offered by vendors for supporting database and application servers. NCR, for example, with its 3000 series of computers, allows the same software to be run on everything from a small uniprocessor personal computer to a massively parallel machine that provides considerably more power than a mainframe. At the high end, parallel systems permit parallel transaction processing for operational systems, and parallel query processing for information and data warehouse applications. Vendors developing products in this area include Oracle, IBM, Informix, Sybase and Tandem. The issue here is that while the hardware provides scalability, frequently the software does not, and potential users must evaluate specific hardware, operating system and database software combinations to ensure that their application requirements can be satisfied.

Middleware

Like client/server, middleware is another overused and much-abused term. There are two main types of middleware: database middleware for connecting client applications to database servers and application middleware for connecting client applications to application servers. Most middleware solutions available today are proprietary, and each client/server hardware and software configuration requires its own unique piece of middleware to provide client-to-server connectivity. The direction here is to standardize the client application program interface and clientto-server protocols. The problem is that there are too many standards to choose

from, and most have yet to reach maturity. Many, especially in the database middleware area, also trade off functionality and performance for standardization. This may be acceptable for information applications but is not acceptable when building operational client/server applications. Key efforts in the database middleware area are Microsoft Open Database Connectivity and IBM Distributed Relational Database Architecture. Key database vendors and many third-party companies such as Micro Decisionware and Information Builders are now beginning to support these de facto standardization efforts. Application middleware efforts include the Open Software Foundation, Inc.'s Distributed Computing Environment, X/Open Company, Ltd.'s and IBM's Common Programming Interface for Communicators, IBM Message Queue Interface, X/Open's XA, and Open Systems Interconnection Transaction Processing.

Summary

Most information technology advances are centered around client/server computing, but this term has become so broad that it is now necessary to break client/server technologies into a number of different frameworks. Organizations wishing to move to a client/server environment need to define for each framework the costs and benefits, the types of applications that can be supported, recommended products, training requirements, the application development architecture and systems management procedures. Only by doing so can they keep risks to a minimum and possibly reap the benefits of new information technologies.

Colin White is president of DataBase Associates, a database consulting and education company in Morgan Hill, California. He specializes in distributed computing and is editor of *InfoDB*, and conference director for DB/EXPO, the national database exhibition and conference. Contact 408-779-0436.





DB/EXPO '94 EXPOSITION AND CONFERENCE

Vendor Listing

ACI US, INC	1628
ACUCOBOL, INC.	2526
ADB	
ALPHA SOFTWARE CORP	530
AMDAHL CORPORATION	1316
ANDERSEN CONSULTING	1302
ANDYNE COMPUTING	1334
APPLE COMPUTER, INC	
ARBOR SOFTWARE CORPORATION	814
ASK GROUP	2208
ASYMETRIX CORPORATION	942
BACHMAN INFORMATION SYSTEMS	
BASIS, INC	
BERARD SOFTWARE ENGINEERING, INC	
BLYTH SOFTWARE, INC	
BMC SOFTWARE	
BORLAND INTERNATIONAL	
BRADMARK TECHNOLOGIES, INC.	2320
BRIO TECHNOLOGY	
BULL HN	
BUSINESS OBJECTS, INC.	3003
CANDLE CORPORATION	
CASE DESIGN	
CLEAR ACCESS CORPORATION	
CLEYAL	743
CMP PUBLICATIONS	1141
COGNOS	
COMPUSERVE DATA TECHNOLOGIES	
COMPUTER ASSOCIATES	
COMPUTER SYSTEMS ADVISERS	2202
COMPUTERWORLD	
COMPUWARE	
COMSHARE	
CONCENTRIC DATA SYSTEMS, INC	
CONTROL DATA SYSTEMS, INC.	13 12
COVIA TECHNOLOGIES	
CROSS ACCESS	
DATA ACCESS CORPORATION	
DATA GENERAL CORPORATION	1838
DATA MANAGEMENT REVIEW	
DATA RETRIEVAL CORPORATION	
DATA-CACHE CORPORATION	
DATABASE ASSOCIATES	
DATABASE PROGRAMMING & DESIGN	24VD
DATABASED ADVISOR	
DATAEASE INTERNATIONAL, INC.	1020
DATAMATION	2041
DATAPRO	221
DATAWARE TECHNOLOGIES	2010
DBMS	
DBOPEN	1027
DHARMA SYSTEMS INC	040
DIGITAL EQUIPMENT	
DIGITAL ECOIPMENT	
DISK EMULATION SYSTEMS, INC.	
DOCUMENT MGMT & WINDOWS IMAGING	3011
DP-TECH COMPUTERS, INC.	
DYNASTY TECHNOLOGIES	
CO SYSTEMS SOFTWARE, INC.	
EMPRESS SOFTWARE, INC.	
ENCORE COMPUTER CORPORATION	1202
	I ZUZ

	_		ı				t		REST ROOMS PHONES			
				343 341 339 337 335	244 343 242 341 240 339	344 443 342 441	444 543 442 541 8ull HN	Paradox PC Por Informat 641 8no Technology	Haber on Learning SCO We read to the listic Wollenge 642 741 Thinking Machines 636		Link SSA 842 941 Im Software Magazine	syme service s
			CAFE	SOL Financial	232 1 228	Software Science 332 Insci 330 Tech ystems 328	NCUBE	Alpha Software \$30 Tools & Tech.	Lotus	Wang Labs	Software AG	Steri
			CALL	SIGS 219 Praxis IntT 213	222 321 220 319	Compuware 322 Intergraph	Logic Works 422	Novell 520	Micro Decisionware 622 Red Herring Software 616	Nicro-Strategy Control Data 722 821 Mastek Dharm 720 819 Ontos Quarter 718 817	Data General 820 rdeck	97
				Comstare 207 205 General Research Corp. 201	208	310	410 Unisys	D8MS & Database Prog. & Design S08 Speedware S02	Informix 708 Popkin Software 602	Software Softbourne Computer 702	Digitalk 00bject Design 892	90
-		Г		Ī	-	-	1	÷	_	1	ř	
S	TORAGE	SERVICE AREA				MEETING	G ROOMS			NORT GATI	TO E TH HALL EWAY & ANADE	ESC.

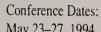
EVERGREEN CASE TOOLS, INC	224
EXPRESSWAY TECHNOLOGIES	194
FOUR SEASONS SOFTWARE	91
FULCRUM TECHNOLOGIES, INC	90
GENERAL RESEARCH CORPORATION DBA	20
GREAT PLAINS SOFTWARE	71
GUPTA CORPORATION	190
HANDS-ON-LEARNING	64
HOLISTIC SYSTEMS	64
HURWITZ CONSULTING GROUP	73
IBM	172
DG	41
IMPERIAL TECHNOLOGY	114
INFORMATION BUILDERS	192
NFORMIX SOFTWARE, INC	70
NFOWORKS	252
NTEL CORPORATION	202
NTERACTIVE SOFTWARE SYSTEMS INC	93
NTERGRAPH	31
O SOFTWARE CORPORATION	221
TASCA SYSTEMS, INC	102
JOHN WILEY & SONS, INC	144
JYACC, INC	132
(NOWLEDGEWARE	110
LOGIC WORKS	42

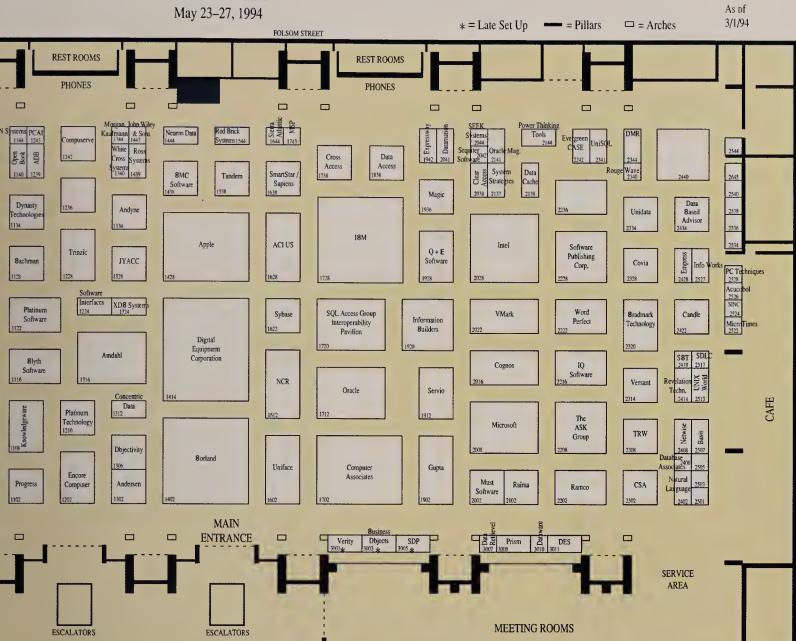
LOTUS DEVELOPMENT CORPORATION	627
MAGIC SOFTWARE ENTERPRISES	1936
MANAGER SOFTWARE PRODUCTS INC	1743
MASTEK SOFTWARE INC	720
MICRO DECISIONWARE	622
MICRO FOCUS	913
MICROSOFT CORPORATION	2008
MICROSTRATEGY, INC	
MICROTIMES	2522
міті	1022
MOMENTUM SOFTWARE	327
MORGAN KAUFMANN PUBLISHERS	1344
MUST SOFTWARE INTERNATIONAL	2002
N SYSTEMS, INC	1144
NATURAL LANGUAGE INC	2402
NCR CORPORATION	1612
NCUBE	427
VETG	1033
NETWISE, INC	2408
NETWORK WORLD	414
NEURON DATA, INC	1444
NEXT COMPUTER INC	514
NOVELL, INC	520
DBJECT DESIGN, INC	802
DRJECTIVITY	1200



MITI

Exposition Dates: May 24–26, 1994





FREIGHT ENTRANCE

FREIGHT ENTRANCE

ONTOS	718
OPEN DATA CORPORATION	1140
OPEN LINK	842
ORACLE	1712
ORACLE MAGAZINE	2141
PARADOX INFORMANT	542
PARCPLACE SYSTEMS	1016
PATROL SOFTWARE, INC.	1438
PC PROFESSIONAL, INC	641
PC TECHNIOUES	2528
PC WEEK	1037
PCAI	1243
PILOT SOFTWARE, INC	1034
PLATINUM SOFTWARE CORPORATION	1122
PLATINUM TECHNOLOGY	1210
POPKIN SOFTWARE & SYSTEMS, INC	602
POWERSOFT CORPORATION	1002
POWERTHINKING TOOLS	2144
PRAXIS INT'L	213
PRISM SOLUTIONS	3008
PROGRESS SOFTWARE	1102
O&E SOFTWARE (PIONEER SOFTWARE)	1236
OUARTERDECK	817
RAIMA CORPORATION	2102
RAMCO SYSTEMS CORPORATION	2202

LOBBY

RED BRICK SYSTEMS	1544
RED HERRING	616
REPORTSMITH, INC	528
REVELATION TECHNOLOGIES	2414
ROGUE WAVE SOFTWARE	2340
ROSS SYSTEMS, INC.	1439
SAPIENS USA, INC.	1638
SBT CORPORATION	2418
SDP TECHNOLOGIES	3005
SEEK SYSTEMS	2044
SEOUITER SOFTWARE, INC.	2042
SERVIO CORPORATION	1912
SIERRA ATLANTIC GROUP	1644
SIGS PUBLICATION	219
SINC INC	
SKRIBE SOFTWARE	1141
SOFTWARE AG OF NORTH AMERICA, INC	828
SOFTWARE INTERFACES INT'L CORP	1224
SOFTWARE MAGAZINE	836
SOFTWARE PUBLISHING CORPORATION	2228
SOLBOURNE COMPUTERS	702
SPEEDWARE	502
STERLING SOFTWARE	928
SYBASE, INC	1622
SYCOMP PTY LTD	934

SYSTEM STRATEGIES	2137
TANDEM COMPUTERS, INC.	1538
TEXT STEMS INT'L	328
THE OBJECT CORP	920
THE RED HERRING	635
THINKING MACHINES	636
TOOLS & TECHNIOUES	528
TRANSARC CORPORATION	1040
TRINZIC CORPORATION	1228
TRW	2308
UNIDATA, INC	2334
UNIFACE CORPORATION	1602
UNISOL, INC	2341
UNISYS CORPORATION	402
UNIX WORLD	2513
VERITY, INC	3001
VERSANT OBJECT TECHNOLOGY	2314
VIA GRAFIX	1043
VMARK SOFTWARE	2022
WANG LABORATORIES	728
WATCOM, INC	1010
WHITE CROSS SYSTEMS LTD	1340
WOLLONGONG GROUP	741
WORDPERFECT CORPORATION	2222
XDB SYSTEMS, INC	1324

Distributed Systems Management—Show Your The natural follow-on to workgroup True Colors



Intil recently, most articles on client/server technology were confined to expounding its virtues, lower cost, productivity benefits, superior user interfaces and widespread applicability. Early experiences with applications at the workgroup level seemed to confirm the promise of this exciting new technology. It is estimated that over 95% of today's client/server market consists of departmental applications in workgroup environments involving between 10 and 100 users. These tend to be stand-alone applications that assist in day-to-day tasks as well as decision making, but are somewhat independent of the larger requirements of the enterprise. The management of such environments is not particularly difficult, despite the lack of adequate tools, and is generally manually driven and locally controlled.

computing successes is to attempt to apply client/server technology to enterprise computing involving mission-critical applications and hundreds or thousands of users. For such a trend to be successful, a robust computing environment must be available to support such applications. In other words, adequate precautions must be taken in the computing environment to ensure that the organization's resources such as hardware, software and data — are protected and potential outages are anticipated and headed off if possible. Also, when outages do occur, ensure that they are resolved without unacceptable loss of business opportunities or information. It is now generally accepted that systems management will be the No. 1 issue that will determine the success of enterprise

The centralized approach, with its proprietary hardware and software and limited heterogeneity, has had a robust computing environment that has evolved over the years through mature tools from system and third-party vendors. Also, it is relatively cost-effective because of the limited number of resources that tend to be centrally located and easily accessible to a few skilled personnel.

A distributed computing environment adds a new dimension to the complexity of sustaining a robust computing environment. Network and systems management issues — such as security management, performance management and operations management, change management, configuration management, fault/problem management, accounting management — require innovative and cost-effective solutions.

- Security management deals with the issues of controlling both physical and logical access to an organization's resources. It involves identifying the critical resources and determining users/programs that should have access to these resources.
- Performance management deals with monitoring and tuning performance problems in the system environment. It also includes collecting historical information for trend analysis and capacity planning, as well as the use of analytical and simulation tools.

- Operations management deals with the tasks of planning, distributing, evaluating and controlling system work loads. It includes backup/recovery and pro-
- Change management involves managing and controlling the changing environment, such as a new software release.

duction control, for example.

- Configuration management deals
 with understanding the various components in the total system environment,
 their interrelationships and operations,
 and ensuring that all the elements
 involved are planned for, designed, created and integrated effectively to meet
 the total system requirements.
- Fault/problem management deals with handling problems and incidents from their initial detection to their final resolution.
- Accounting management deals with collecting system and resource usage information by registered users of the system, then allocating costs appropriately.

These categorizations vary throughout the industry, and vendors choose to muddy and proliferate these definitions to support the products they market.

The complexities introduced by a distributed environment include the problems of scale (the number of resources to be managed could be in the hundreds or thousands), heterogeneity of hardware and software platforms requiring different tools and operation skills, geographically distributed systems that may span multiple organizations, legislative boundaries and time zones (making it difficult to formulate a single distributed systems management policy for all disciplines; a federated policy might be the only alternative), lack of industry standards in some cases, proliferation of standards in other cases, availability of skilled personnel at the remote sites, and reliability of the hardware and software, just to name a few.

What this translates into is that in a typical distributed environment involving hundreds to thousands of resources, at any typical moment, there could be a small percentage of resources that are either

Colleugues!



The World's Largest Database, Client/Server, & Information Technology **Exposition & Conference**

"See Real IT at Work... at DB/EXPO"

Exposition • May 24-26 Conference • May 23-27

San Francisco Moscone Convention Center

Exciting Keynotes

Andrew S. Grove, Intel Corporation Larry Ellison, Oracle Corporation Philippe Kahn, Borland International Umang Gupta, Gupto Corporotion Jerre Stead, NCR Corporotion Steve Mills, IBM Corporation Dr. Robert Epstein, Sybose Dr. Jim Gray, DEC **Don Haderle**, IBM Corporation Colin White, Conference Director

9 Answer-Packed Conferences

Executive DB/EXPO
Object-Oriented Application Development
Client/Server Application Development
Enterprise Client/Server Computing
Client/Server Systems Management
Data Warehousing
Desktap Database Conference Interoperability and Open Systems Emerging Technologies

Over 700 Dynamic Exhibits

- Amdahl Apple Computer Barland
 Camputer Associates DEC Gupta IBM
 Information Builders Intel Latus Microsoft
 NCR Navell Oracle Pawersaft SAP
 Sybase Uniface Unisys and many more!

200 Expert Speakers

In-Depth Seminars

"I learned more in four hours at DB/EXPO than in months of gathering information"

Data Base Administrator Hewlett-Packard

> Call today for your

-800-2DB-EXPO

Please send me:

- ☐ My DB/EXPO '94 Canference Brachure
 - Complimentary Exhibit Passes
 - Infarmatian an becaming an exhibitar

orochure

2111

Company

Street:

City: Telephone

FORM (415) 966-8934



Blenheim NDN, Inc. is a subsidiary of Bruno Blenheim Inc. 444 Castra Street - Suite 1101 - Mauntain View - Colifornia 94041 Tel: (415) 966-8440 - Fax: (415) 966-8934

unavailable or performing inadequately. Beyond a particular point, adding skilled personnel is not enough when responding inexpensively, quickly or effectively to the problems, and new techniques have to be innovated to deal with these situations. This threshold of pain varies from installation to installation and depends on the unique requirements and distributed configuration of each organization.

To meet the challenges of distributed systems management, what is required is an architecture and integrated tool set for a heterogeneous computing environment that provides in a cost-effective and seamless fashion. A totally self-managing environment should also offer an organization the capability to customize the architecture and tool set to suit its centralized, decentralized or mixed-mode management policies.

The reality of today's distributed systems management solutions is that it falls very short of the aforementioned requirements.

Obviously, the degree to which an organization's distributed environment must be robust depends on the kinds of business applications the environment is required to support and the cost/benefit analyses of putting adequate safeguards in place. In practice, distributed computing environments come in many shapes and sizes.

Recognizing the trend toward enterprisewide computing and the potential opportunities for products to manage such environments, a number of vendors and consortiums are proposing frameworks (and products conforming to these frameworks) to manage a heterogeneous distributed computing environment. They are also encouraging third-party vendors to write distributed systems management applications to the specifications of their frameworks. The frameworks being proposed for managing distributed environments are IBM's SystemView, Hewlett-Packard Co.'s OpenView, Digital Equipment Corp.'s Polycenter, Tivoli Systems, Inc.'s TME, for example.

These frameworks use different terminologies, and the vendors are currently concentrating on their own specific environments — for example H-P's OpenView and Tivoli's TME only deal with Unix operating platforms, Digital's Polycenter deals with VMS and Unix, while IBM's SystemView concentrates on its Systems Application Architecture and AIX platforms. However, the system vendors do plan to expand their architecture horizons to include heterogeneous environments in

the future. Established systems management application vendors — such as Candle Corp. (an IBM SystemView alliance partner), with its Candle Technologies architecture, and LEGENT Corp. (alliances with Tivoli, H-P, Sun Microsystems, Inc. and others), with its XPE architecture — are also planning to become players in the distributed systems management market.

The closest thing to a standard for an architecture is the one defined by the Open Software Foundation, Inc. (OSF) consortium in Cambridge, Mass., with its Distributed Management Environment (DME). DME's objective is to provide a structure under which the management of systems and networks can be brought together. DME runs on top of Portable Operating System Interface-compliant operating systems and takes advantage of support services in the OSF Distributed Computing Environment. DME consists of a management framework and six distributed management services - software distribution, printing, license management, an event, subsystem management and a personal computer. The OSF has slipped DME availability dates repeatedly, and there is speculation that commercial DME products may not be available until sometime in 1995. Most analysts, including myself, now believe that DME may have missed the boat altogether.

However, much of the publicity surrounds products from vendors such as Computer Associates International, Inc. (CA-Unicenter), Tivoli, OpenVision Technologies, Inc., Compuware Corp.'s Compuware EcoSystems, Patrol Software, Inc. (recently acquired by BMC Software, Inc.) and Novadigm, Inc. With some exceptions, these companies' products primarily operate in Unix environments.

The aforementioned companies' products are all laudable in their efforts to provide distributed systems management support, but appear to be a long way from supporting total enterprisewide systems management. Their platform support is limited (mostly to Unix), many of the systems management applications are not yet integrated, and the scalability of these applications is unknown.

The tools for distributed systems management fall into three basic categories:

• De facto standard frameworks and integrated tool sets, which are the long-term strategic solution to the problem of distributed systems management; however, it will be many years before it is likely to come to fruition.

- Single-vendor solutions to address multiple systems management disciplines for one or more platforms, but do not currently provide open interfaces for integration with tools from other vendors. Products such as Computer Associates' CA-Unicenter and Candle's CT fall in this category. If these tools can provide adequate relief to systems management problems within an organization, then their lack of open interfaces will not inhibit their widespread acceptance.
- Tools for specific systems management disciplines that support multiple platforms from individual vendors. These tools provide excellent solutions for specific environments but suffer from the fact that they tend to use proprietary techniques and, therefore, do not integrate well with other tools.

While the frameworks offer the best hope for the future, the challenges Network IS professionals face to get them accepted seem monumental. The current proliferation of consortiums and vendors with their own frameworks who promise to either conform or be compliant with the OSF's DME or any other "standard" that may take on a dominant position in future seems more like hype than reality. It does not seem very likely that in the near future, we will see the emergence of a standard framework with a universally accepted metamodel of the objects to be managed. Such a confused state of affairs will likely continue for a few years to come until the marketplace sorts out de facto standards and technologies based on products that meet customers' requirements.

In the meantime, organizations planning to implement mission-critical applications in a heterogeneous distributed environment should resign to the notion that they need to find systems management applications from one or more vendors that best suit their particular environment, then integrate them using homegrown bridges. This strategy has proven successful in organizations that have claimed success in implementing a distributed computing environment.

Nagraj Alur is principal of DataBase Associates, a database consulting and education company in Morgan Hill, California. He specializes in database design, DB2 performance, downsizing and interoperability and is an associate editor of *InfoDB*. Contact 408-779-0436.

For more information or to order additional copies of this White Paper, contact Evilee Thibeault at 508-875-6400.

All trademarks are the property of their respective holders.



Understanding Broadband Networks: Architectures, Protocols & Implementation



Business communication is taking a major step forward as ATM, Frame Relay and SMDS broadband technologies enable companies to develop high bandwidth applications.

Understanding Broadband Networks: Architectures, Protocols and Implementation is a powerful two-day seminar that will provide you with a detailed understanding of the technologies that are shaping network strategies today and through the remainder of the 1990s. If you need a thorough understanding of the technical operation and applications for Asynchronous Transfer Mode (ATM), Frame Relay and Switched Multimegablt Data Service (SMDS), this is the seminar to attend.

Attending this 2-day seminar will help you ...

- Compare the technologies and operation of ATM, Frame Relay and SMDS.
- Evaluate the application/technology matrix which broadband technology is best suited to your specific applications.
- Discover the driving forces behind ATM, and how cell switching technology may revolutionize business communication.

Dates and Locations

April 28-29 May 10-11 The 57 Park Plaza May 12-13 New York, NY May 24-25 Chicago, IL Holiday Inn/O'Hare June 1-2 Wash., DC

June 8-9 Dallas, TX June 21-22 June 23-24 June 28-29

Northeast Atlanta Hilton

- Prepare for the next generation of internetworking challenges: Frame Relay/SMDS, Frame Relay/ATM and SMDS/ATM connections.
- Learn the signaling protocols that are used to establish ATM or Frame Relay connections.
- Understand the differences between packet switching
- Consider broadband network management architectures and protocols, such as the Local Management Interfaces (LMI) and the Customer Network Management (CNM) systems.

Understand how various interfaces and systems such as the various Local Management Interfaces and Customer Network Management need to be incorporated into your broadband networking architecture. Examine case studies, illustrated with protocol analyzer data, that demonstrate the operation of these protocols in depth.

Directed by Mark A. Miller, P.E., author of six best-selling books on internetworking technologies, this seminar teaches you the details necessary to implement broadband networks. If you need to get beyond marketing hype and really understand broadband architectures and protocols, you should attend this seminar.

- Contrast the operation of Frame Relay and X.25 protocols.
- Learn how existing transport technologies such as TCP/IP and Novell's NetWare can be integrated with broadband protocols.
- Understand how SONET and fiber optic transmission will fit into broadband networking.
- See how SNMP will play a key role in broadband network management.
- Be prepared to evaluate the broadband service offerings from the Local Exchange Carriers (LECs) and Inter-Exchange Carriers (IXCs).
- Discover the roles of the broadband implementers: the ATM Forum, the Frame Relay Forum and the SMDS Interest Group.
- Obtain the status of the current standards for ATM, Frame Relay and SMDS.

Your Registration Includes ...

- Comprehensive seminar workbook, over 500 pages in length!
- Four exclusive protocol reference guides: Frame Relay, SMDS,
- Support disk containing reference documentation and standards supporting Frame Relay, SMDS and ATM

SONET and ATM

- Limited Edition of best-selling — Network diagramming
- Luncheons and break refreshments

\$795.00 Registration Fee NOTE: If you can't attend, a full attended materials kit is available for just \$99.95!

Co-sponsored by:

COMPUTERWORLD

for a Complete Seminar Outline and Registration Form 800-756-9430

when prompted, request document #80

Dial Our Fax-Back Information Line

Official Sponsors

ascom Timeplex





Register Today for the Seminar Nearest You! CALL 800-643-4668

RANK	1991	COMPANY		
133=	1	GENERAL MC	TORS Detroit	
1	2	-VVON Irving	Texas	
2	3	TODO MOTO	R Dearborn, Mile	
3	4	- Juch	JESS MAUTIN	
4	E	GENERAL E	LECTRIC Fairner	
5		MOBIL Fairf	ax, Va.	
	7	PHILIP MC	ORRIS New York	
	7 8	E.I. DU P	ONT DE NEMO	
		CHEVRO	N San Francisco	
	3	9 TEXACO	White Plains, N.Y.	Michael
	10			

98 of the top 10 'Fortune 500' companies are using Oracle7."

Here's what our customers are saying about Oracle7:

"It's the driving force behind our most sophisticated applications."

"You can't break it, it just keeps running and running."

"It's the best Client/Server solution out there."

"We needed a truly open solution: Oracle7 is it."

To find out more about why companies of all sizes are choosing Oracle7, call us. We'll send you in-depth analysis from IDC and Aberdeen, and you'll see for yourself why everyone is so excited. 1-800-633-0573 Ext.3720



©1994 Oracle Corporation. Fortune is a trademark of Time Inc.

CLIENT/SERVER APPLICATIONS

Distributed Databases, Messaging, Groupware, Imaging and Multimedia

BRIEFS

Mobius Management Systems, Inc. of New Rochelle, N.Y., this week will announce a document management application that will link desktop clients with mainframe document servers.

The company's DocumentDirect software will let end users call up scanned images and documents as well as mainframe-based reports. The software supports Windows, DOS and OS/2 clients. Server software, which resides on an IBM mainframe, provides such functions as indexing and report distribution, and can access a variety of back-end storage devices.

Server prices cost \$40,000 to \$180,000. Client licenses are sold on a concurrent-session basis, starting at \$14,990 for 10 concurrent sessions.

Mobius: (914) 632-7960.

Open Data Corp. this week will announce a new version of its database access software. FindOut, formerly called OpenBooks, is designed to let end users access information in SQL databases while shielding them from the complexities of writing SQL statements. This can also free information systems departments from having to generate these queries and reports, the company said.

FindOut now comes with a new ad hoc query and analysis tool, as well as a "business dictionary" - an overall view of an enterprise's database information through which an end user can move by clicking on section tabs. The software will run on Windows and OS/2 clients, and connect to a variety of SQL databases.

FindOut Analyst, the end-user software, starts at \$995 per license. FindOut Builder, used to build database views, starts at \$4,995 per license.

Open Data: (617) 860-8300.

Prodea Software Corp. in Eden Prairie, Minn., last week introduced a new version of its Prodea-Synergy software for linking desktop and networked applications. ProdeaSynergy 2.0 adds support for Microsoft Corp.'s Object Linking and Embedding 2.0, as well as a server version that allows for creation of shared libraries of applications. The software lets end users create processes in which data can be moved and shared between existing applications. Both client and server versions are Windows applications and rely on a user's existing networking protocols.

Prices start at \$495 for a single license; \$4,500 for a 10-user server license.

Prodea: (612) 942-1000.

PeopleSoft, Inc. recently announced that it has begun shipping aresume add-on to its human resources management client/server application software. The firm's Resume Reader, developed by Restrac, Inc. of Dedham, Mass., incorporates optical character recognition and search functions to allow for automatic scanning and processing of resumes. The software is available for use with PeopleSoft software running on Gupta Corp.'s SQLBase relational database management system for OS/2 servers. PeopleSoft expects to ship versions for other databases in the third quarter.

Pricing for the resume module starts at

PeopleSoft: (510) 946-9460.

Quest to put EDI in an E-mail envelope could pit VANs against the Internet

Potential battle between X.435 and MIME EDI standard is on the horizon.

BY ADAM GAFFIN AND ELLEN MESSMER

Value-added networks (VAN) could soon face stiff competition from the Internet for electronic data interchange business.

Even as VANs upgrade their networks to let customers exchange EDI transactions wrapped in X.400 mail envelopes, the Internet community is hard at work on new ways to tie EDI into mail messages using the Multipurpose Internet Mail Extensions (MIME).

VANs insist that their business customers will never put EDI transactions out over the Internet. But the Department of Defense is setting up its electronic commerce system using the Internet, while other government agencies are working with private companies to conduct commerce over the Internet.

DEFINING STANDARDS

High-volume electronic commerce using EDI - a set of standards that defines how companies can exchange invoices, purchase orders and other documents electronically - has typically been done using dial-up or dedicated lines, said Dan Blum, principal at

Rapport Communication in Takoma Park,

But sending EDI forms in store-and-forward messages is a natural evolution — one envisioned in a standard called X.435, which defines how to route EDI transactions over an X.400 network, Blum said. X.435,

Emerging EDI options

X.435 - An international standard that defines the way EDI messages can be incorporated with E-mail messages across an X.400 network. Several VANs have announced plans to upgrade their X.400 networks to support X.435. Advantages of the technology include security and reliability.

MIME - The Internet Engineering Task Force recently discussed ways to send EDI messages with MIME via Internet E-mail. Advantages include ease of addressing and the Internet's global reach.

GRAPHIC BY TERRI MITCHELL

however, requires the use of 1988 X.400 software, which few users or VANs have deployed.

That is changing. GE Information Services (GEIS) last week announced support for X.435. Advantis, the IBM-Sears joint

venture, last week also announced impending support for X.435 later this year. Sprint International said it hopes to support X.435 by year end.

Martha Hanlon, director of electronic commerce product management and marketing for MCI Communications Corp., said

the carrier will merge its newly acquired BT EdiNet with MCI Mail.

REACHING AGREEMENTS

Pat Carlton, GEIS' X.400 product manager, said the company hopes to reach interconnection agreements with other VANs and national telephone authorities within a year to provide global X.435 service.

John Sinko, EDI product manager at AT&T EasyLink Services, Inc. in Parsippany, N.J., and Upendra Gupta, product manager at Sprint International, said they are also looking at potential inter-

They acknowledged light demand to date. Sinko said AT&T EasyLink still has no takers for an X.435 relay service launched in

"If I'm not

getting a

[Notes]

message and

some program

can tell me why.

that would

be great."

See Quest, page 38

GROUPWARE

Notes mgmt. software on the way from Shany

PREVIEW

CARYNGILLOOLY

Mountain View, Calif.

Shany, Inc. next month is expected to extend its AlertView application management product to support Lotus Development Corp. Notes networks.

Shany, based here, will deliver workstation-based agent

software that will signal AlertView management consoles when problems with Notes arise, such as when a Notes client cannot access a Notes server. The software will be introduced at NetWorld + Interop 94 in Las Vegas next week.

AlertView consists of three components: the AlertView Manager and the Event Monitor, both of which reside on a dedicated Windows-based management console, and AlertView Agents, which reside on networked workstations.

The new software Agent for Notes proactively reports all Notes-related problems to the Event Monitor. Besides passing on information about events such as Notes server connection failures, the agent can report

which workstations are involved and the time at which the error occurred.

The Event Monitor then logs the event and launches a corrective procedure based on rules preconfigured by the net administrator. Fixes can include restarting downed connections, resetting modems and even rebuilding Notes databases that contain corrupted data.

The AlertView Manager maintains a database of events

as well as a list of all the workstations the product is monitoring. It also provides a graphical user interface through which administrators can see this information and get statistical data

about when failures occur most often. The system will also automatically identify the prevalent causes of failures and recommend a course of action.

AlertView can run on a variety of = networks, includ-

IBM LAN Server. It works with a variety of enterprise management systems, such as Hewlett-Packard Co. OpenView, IBM NetView, SunConnect SunNet Manager and Novell NetWare Distributed Management Ser-

According to analysts, Notes itself does not provide many tools for management, and, at this point, there are not a lot of third-party tools that fill the Notes management void.

"If I'm not getting a [Notes] message and some program can tell me that and tell me why, that would be great," said David Coleman, a principal of Collaborative Strategies, a consulting

firm based in San Francisco. "And if it does this transparently, would be even bet-

Arthur Greene, co-owner of Veritas Technologies, Inc., a systems integrator in Dallas, said, "I would

ing Novell, Inc. NetWare, Micro-suspect that almost every Notes soft Corp. LAN Manager and shop has already written something for internal use [for Notes management]," highlighting the need for third-party products. "This is definitely a budding market."

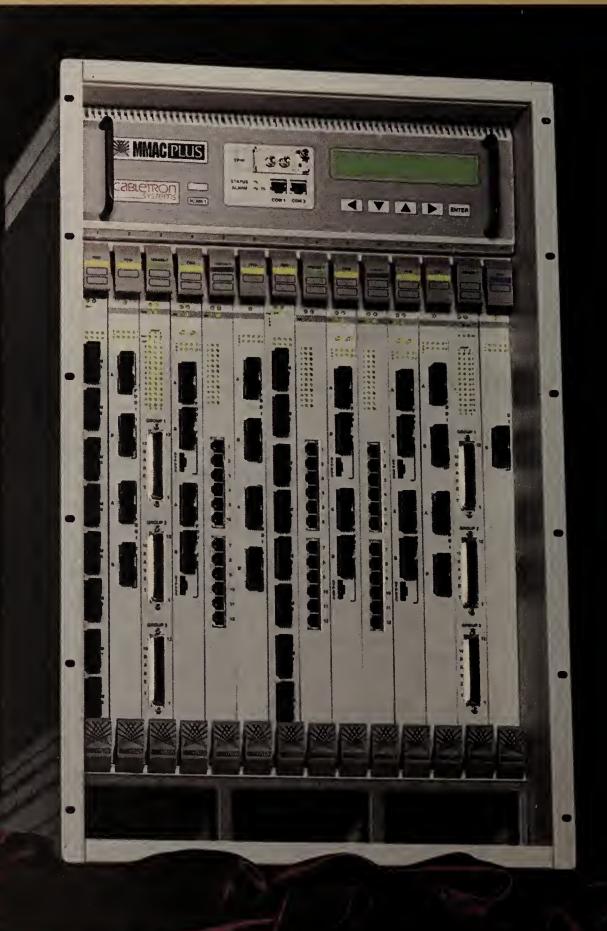
Although pricing and availability details of the new Alert-View for Notes Agent were unavailable, a Shany spokeswoman said pricing would be similar to the firm's AlertView for cc:Mail Agent, which costs

©Shany: (415) 694-7410.

NETWORK WORLD APRIL 25, 1994 35

THE COMPETIT

INTRODUCING THE MMAC-PLUS, THE



ON IS FINISHED

FIRST TRUE PACKET SWITCHING HUB.

the MMAC-Plus, you'll never have to compete for bandwidth again. That's because the MMAC-Plus features integrated switching technology to support both packet-based and ATM cell-based networks. Now you can create dedicated user-per-port LANs that will provide for many classes of service — including E-mail, video conferencing and more — and still guarantee that each user receives the fast, reliable service he or she needs.

Through a unique packet/cell switching backplane and Cabletron's innovative SecureFast[™] Packet Switching, the MMAC-Plus delivers the best benefits of ATM technology . . . while preserving your existing investment in Ethernet, Token Ring and FDDI. No other vendor can make that claim.

Features include:

- An aggregate bandwidth in excess of 10 Gbps.
- Aggregate switching greater than 5 million packets/cells per second.
- Over 500 ports of connectivity.
- Support for over 160 switched LAN segments and a virtually unlimited number of shared-access LANs.
- Supports mixed Ethernet, Token Ring, FDDI, ATM and WAN connections.
- Supports integrated MAC layer bridging, network layer routing, SecureFast Packet Switching and ATM cell switching.
- Embedded network analysis tools.
- Fully fault tolerant design.

NETWORLD+INTER P 94
See Us At Booth #3345 MAY 2-6, 1994

A hub is not just a hub. For more information on the next-generation hub platform that starts where the competition finishes, call (603) 337-2705 for your free, informative white paper, Cabletron's MMAC-Plus: A True Switching Hub.



SDK turns client/server programs into distributed computing systems

Segments applications into components, reducing run-time.

BY KEVIN FOGARTY

Minneapolis

Aggregate Computing, Inc. is trying to make client/server systems capable of true distributed comput-

The company will release May 2 the NetShare SDK, a software developers' kit designed to let in-house software developers create applications that will run on several machines at once.

NetShare SDK essentially breaks large applications into components, then sends the pieces to different servers to run independently, said Joan Wrabetz, president and chief executive officer of Aggre-

The kit comes with application program interfaces (API) that let users link homegrown client/server applications to NetShare SDK.

Once linked, NetShare SDK transparently distributes the application components across heterogenous nets, selecting the platform and operating system, Wrabetz said.

Except for the Resource Informa-

tion Service, which sits on a server and keeps track of the configuration and status of available servers, Net-Share SDK runs on clients.

SAVING TIME

Running pieces of an application simultaneously on different servers rather than having them run sequentially on one machine drastically reduces the time it takes to run complex applications, Wrabetz said.

Applications such as stock-market analytics, which run thousands of market-behavior simulations to establish risk profiles and make investment recommendations, are a prime example of the type of application that could benefit from NetShare SDK, she said.

The NetShare tech-

nology currently maintains communication only between the originator and the pieces of a single application. It cannot let pieces running in parallel on different servers talk to each other, though the company plans to add that capability in the future, according to Wrabetz.

The product is targeted at two main groups: users whose applications have outgrown workstations and users trying to downsize from mainframes to client/server systems without abandoning the applications they developed for their hostbased systems.

COST-EFFECTIVE WAY

The product makes good use of available resources and can save runtime on applications that contain lots of independent pieces, according to Norton Greenfeld, director of Unix systems and applications at Computer Intelligence InfoCorp, a market research firm in Santa Clara,

"It's a really cost-effective way of running that kind of application. The question is, how many applications of that kind are out there?" Greenfeld said.

Corporate planning applications, manufacturing control and scheduling software could use Net-Share SDK's approach, he said. But other applications require a central computing environment.

"The mainframe applications that are downsizing tend to be difficult to break into individual chunks," Greenfeld said.

"Either they are central database-oriented or transaction-oriented, or they are monolithic. If they are currently running on a mainframe, that's how they're designed," he added.

NetShare SDK supports Sun

Microsystems, Inc.'s Open Network Computing and the Software Open Foundation, Inc.'s Distributed Computing Environment protocols.

It runs only on platforms, Unix Sun's SunOS 4.X and Solaris, Hewlett-Packard Co.'s HP-UX and IBM's AIX.

The firm plans to release versions for Digital Equipment Corp.'s Ultrix and General Corp.'s DG/UX.

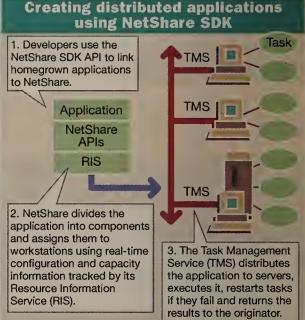
In addition, it can

use proxy agents to access any application that supports a remote execution service or a distributed-file service, such as Sun's Network File System for Unix.

The company plans to release within 18 months a version that will run on Novell, Inc.'s NetWare connected to personal computer clients, Wrabetz said.

OEM AGREEMENTS

Aggregate has signed OEM agreements with configuration-management vendor CaseWare, Inc. and with computer-aided design software developer Zycad.



GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: AGGREGATE, MINNEAPOLIS

NetShare SDK is priced at \$20,000 for a five-machine developer license, plus a run-time fee of \$1,000 per client.

© Aggregate: (612) 546-5579.

GROUPWARE

Lotus Notes offers high ROI, study shows

BY ADAM GAFFIN

Framingham, Mass.

A Dallas drug treatment center was able to nearly triple the number of clients it cares for without adding any employees to its staff, thanks to Lotus Development Corp.'s Notes groupware application.

WRABETZ

This and other success stories were cited in a report released last week by International Data Corp. (IDC), a market research firm in Framingham, Mass., that pointed to large returns on investments by companies that have adopted Notes as a platform for collaborative computing.

Palermo said companies that used Notes as a platform for redesigning entire business processes tended to have the largest and quickest paybacks, but that even companies using it to automate a single departmental application experienced significant

One thrilled Notes user is Dian Uher Gannett, who is in charge of information services for Dallas Helps, a group that coordinates drug treatment programs at 20 facilities throughout

Dallas Helps and the drug treatment centers use Notes to track treatment and clinic outcomes. This helps the group and

> the centers measure success rates as well as spot needs for new treatments quickly, Gannett said.

> Dallas Helps and the centers also use Notes to do billing and post notices of the availability of treatment slots for specific types of clients. By dramatically reducing paperwork errors, the system — an OS/2Notes server linked by modems to Notes clients at the centers — has dramatically increased the speed with which the clinics receive reimbursement from govern-

ment agencies and insurers.

At one facility, according to Gannett, workers used to fill out 15 separate paper forms for each incoming patient, as well as try to track them on giant whiteboards in a room set aside for just that purpose.

Now intake workers fill out client admittance information in a Notes form, with information routed automatically to the appropriate databases. The result has been that the center can now handle nearly three times as many clients as before, with no increase in staffing, she said.

"Essentially, Notes is the platform that really made it hap-

Quest

Continued from page 35

VANs emphasize that their customers are wary of the Internet, finding it short on security and lacking guaranteed delivery.

"Large companies say they will never consider putting EDI transactions on the Internet," Sinko said.

Others wonder if that is true. "There is a lot more interest in the

MIME Internet standard" than in X.435, said Torrey Byles, associate director of the electronic commerce program at BIS Strategic Decisions, Inc. in Santa Clara, Calif.

Dave Crocker, an engineer at Silicon Graphics, Inc. is leading an Internet Engineering Task Force effort to define standards for transporting EDI over MIME.

Because of the Internet's ubiquity and ease of addressing, trading partners could also use the net to set up EDI exchanges. At least one VAN, Simplix of Troy, Mich., is already using Internet E-mail for EDI. "We believe in the

internet flat-rate model as opposed to the standard VAN approach of charges per character," Simplix President George Chisa said.

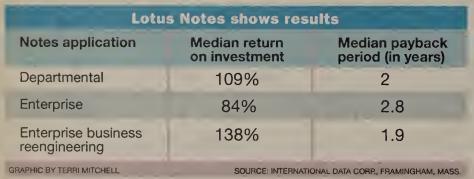
Standard public-key encryption techniques will be incorporated to ensure the privacy of EDI messages and give users a way to verify the sender or recipient, Crocker said.

The recent launch of CommerceNet, a \$12 million government and private venture, could provide another EDI link for businesses. CommerceNet currently relies on a version of Hypertext Transport Protocol, which lets users place orders through on-line forms.

By itself, it is not designed to support EDI. But Bob Frank, project manager at the Lawerence Livermore National Laboratory, a participant in CommerceNet, said work has already begun to develop links between CommerceNet servers and EDI software.

BIS' Byles said that even an Internet-dominated world would have plenty of room for the VANs.

But Blum warned, "The VANs have a limited window of opportunity for 1988 X.400 and X.435" before the Internet competition gets serious. 2



From enhancing productivity by eliminating paperwork to saving money by doing away with mainframes, Notes meant impressive gains for 65 Notes-using companies stud-

'People in the Notes world can fairly [say] they got their money's worth," said Scott McCready, a senior consultant at IDC

The study was funded by Lotus, but McCready and Ann Palermo, also an IDC senior consultant, said Lotus had no say over the study's design or conclusions.

Overall, the study finds an average return of investment of 179%, with an average payback period of 2.4 years.

We've got to stop meeting like this.

Business people spend entirely too much time in hotels. And airports and rental cars. Frankly, there's no excuse for it now that there's SelectVideo Plus[™] from Southwestern Bell. Because SelectVideo Plus technology makes videoconferencing and data transmission affordable for virtually any size business.

The savings start with public switched video rates, which are significantly less than



the dedicated circuits
previously required.
And they continue with

new national standards that give you the flexibility to connect with nearly every existing system quickly and easily.

To see a demonstration of SelectVideo Plus service, stop by the Southwestern Bell ICA Expo exhibit, "Route '94: The Information Highway," at the Dallas Convention Center, May 24-26. And discover an exciting new way to meet face to face.

And start meeting like this.



New SelectVideo Plus videoconferencing and data transmission services will let you meet on a more personal basis, with more people, more often, more affordably than ever before. It's definitely time to start meeting like this. 1-800-859-SWBT, Ext. 111

Southwestern Bell Telephone

Editorial

The network landscape is littered with the corpses of organizations formed to address some technology issue or user concern. The groups — forged in idealism and spurred by ambitious agendas — lost their vitality and never came close to achieving their goals.

The Desktop Management Task Force (DMTF), whose charter is to ease desktop systems management in enterprise nets, is one group that is bucking the trend. Formed two years ago, the group has actually delivered its Desktop Management Interface (DMI) specification, which describes how to get management information from desktop hardware and software regardless of the supplying vendor.

The DMTF is pushing vendors to develop products based on the spec and urging users to demand DMI-ready devices from their suppliers. We applaud

their efforts in this regard.

for interoperability.

But for the DMI to become pervasive enough to be effective, much has to happen. And opening the communication lines between the DMTF and the Open User Recommended Solutions (OURS) group would be a big step in the right direction. OURS was formed in 1991 to solve some pressing interoperability problems.

One OURS task force — the What Works With What group — is committed to producing a reference model for hardware and software products that would define their basic components, features and qualities. These descriptions would make it easier for users to compare products and judge their potential

It makes sense to include the DMI spec as part of OURS' reference architecture so users could gauge the manageability of the products they are evaluating and how well those products interoperate with the various network management platforms currently available.

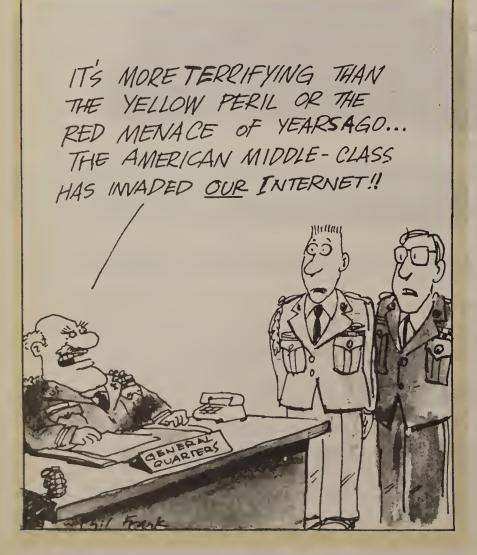
In a market that becomes increasingly more crowded each week, it's hard to grab the attention of the users. But the messages being put forth by the DMTF and OURS deserve to be heard and evaluated. And since those messages go hand in hand, it also makes sense for these two organizations to dovetail their efforts.

Working together, the DMTF and OURS could gain added exposure and possibly bring users one step closer to products that are truly interoperable and manageable.

-> SKIP MACASKILL

smacaski@world.std.com

TELETOONS FRANK AND TROISE



THE BLUE VIEW

by Anura Guruge

IBM banks on HPR to repair its enterprise net image

ture, High Performance Routing (HPR), IBM has a good shot at reestablishing its much-tarnished credibility as a major force in enterprise networking. Users who have all but given up on IBM networking solutions owe it to themselves to put their skepticism aside and check out what HPR has to offer.

ith its latest networking architec-

HPR, formerly known as APPN+, is the crux of IBM's next generation of networking solutions. IBM's apparent impotence on the networking front, of late, has been the result of IBM waiting for HPR to be ready.

However, implementations of HPR should be available relatively soon. With luck, we might even get a sneak preview at Interop 94 Spring next week. The first implementation is likely to be on IBM's "new-generation" 6611 bridge/router (NW, Dec. 20, 1993, page 28).

With HPR — augmented by AnyNet and Asynchronous Transfer Mode (ATM) — IBM hopes to be able to persuade about half of its current 50,000-plus Systems Network Architecture customer base to continue with an

IBM-centric networking solution. AnyNet and ATM, respectively, will ensure that these new HPR-based nets will be able to support multiple protocols (as required for local-area network interconnection) and will be broadband.

HPR will be derided by many as yet another profitmotivated initiative by IBM to lock customers into a long-duration proprietary trap, like the company has done with SNA. With Transmission Control Protocol/Internet Protocol-inspired open networking now very much in vogue, this stance against HPR is understandable and valid.

IBM's justification for HPR, however, is also rational and defensible. SNA and TCP/IP, the two major networking schemes today, are now long in the tooth. Both were conceived in an era where 19.2K bit/sec was considered high-speed networking, as opposed to the gigabit/sec speeds of today. While SNA and TCP/IP have gone through many function-enhancing evolutionary steps within the last two decades, they have characteristics that hark back to their origins.

SNA is not a dynamic networking scheme, while TCP/IP is far from being plug-and-play. Although Advanced Peer-to-Peer Networking (APPN), the original heir to SNA, is the epitome of contemporary plug-and-play networking, it still lacks dynamic networking capabilities, and was never rigorously architected to be a high-class networking scheme.

Given this situation, the time really is ripe for some revolution in enterprise networking, rather than some more incremental evolution.

HPR, hyperbole notwithstanding, is indeed a revolutionary breakthrough — for IBM, at least. If nothing else, after 27 years, HPR has introduced to IBM networking dynamic alternate rerouting in the event of path failure or path congestion. This is a facility that most people still find hard to believe is not in SNA or APPN. Moreover, HPR, like IP, uses a connectionless Layer 2 protocol for routing data packets over a previously established path. Until now, using connectionless protocols was alien to IBM.

To cap it all, HPR does all of its end-to-end routing in Layer 2 — the so-called Data Link layer — as

opposed to Layer 3, which is where such routing is done by other networking schemes. Doing the routing in Layer 2 and using a connectionless protocol should ensure fast data packet routing commensurate with the HPR moniker.

Though HPR as a whole is a new and compelling networking scheme — worthy of being called a next-generation architecture — most of its key features have been borrowed from other networking schemes. HPR, as thus, is best viewed as an inspired synthesis of the best features of IP, SNA, APPN and frame relay.

The connectionless, dynamic routing of HPR,

replete with its dynamic alternate rerouting, has its roots in IP. End-to-end connections (sessions), on top of the connectionless routing, are still used by HPR to ensure guaranteed data delivery and a degree of deterministic performance. This concept of sessions, as well as the use of LU 6.2 sessions as its native mechanism for Layer 3 and above data transfer, stem from SNA.

APPN supplies HPR with its plugand-play facilities, its sophisticated multiple criteria-based path selection

scheme and its dynamic topology database update mechanism. And finally, HPR's notion of a stream-lined protocol, with link error checking being performed only at the end node, is similar to the one advocated by frame relay.

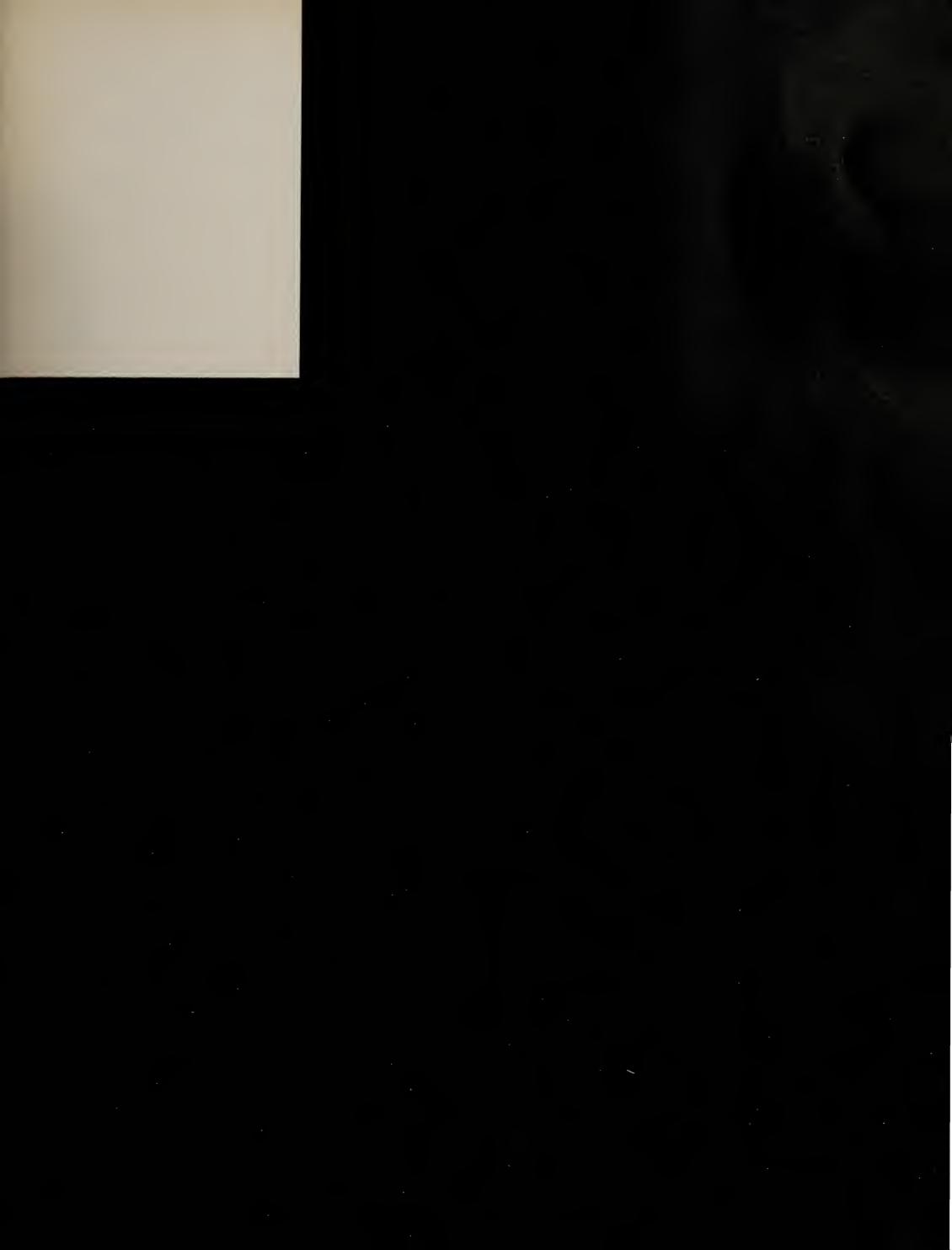
HPR will consist of three components — Automatic Network Routing (ANR), Rapid Transport Protocol (RTP) and Adaptive Rate-Based Congestion Control. ANR provides the connectionless data routing facility using a route information field similar to that used in IBM Token Ring source-route bridging. RTP, which runs on top of ANR, provides the low overhead, end-to-end connection-oriented protocol.

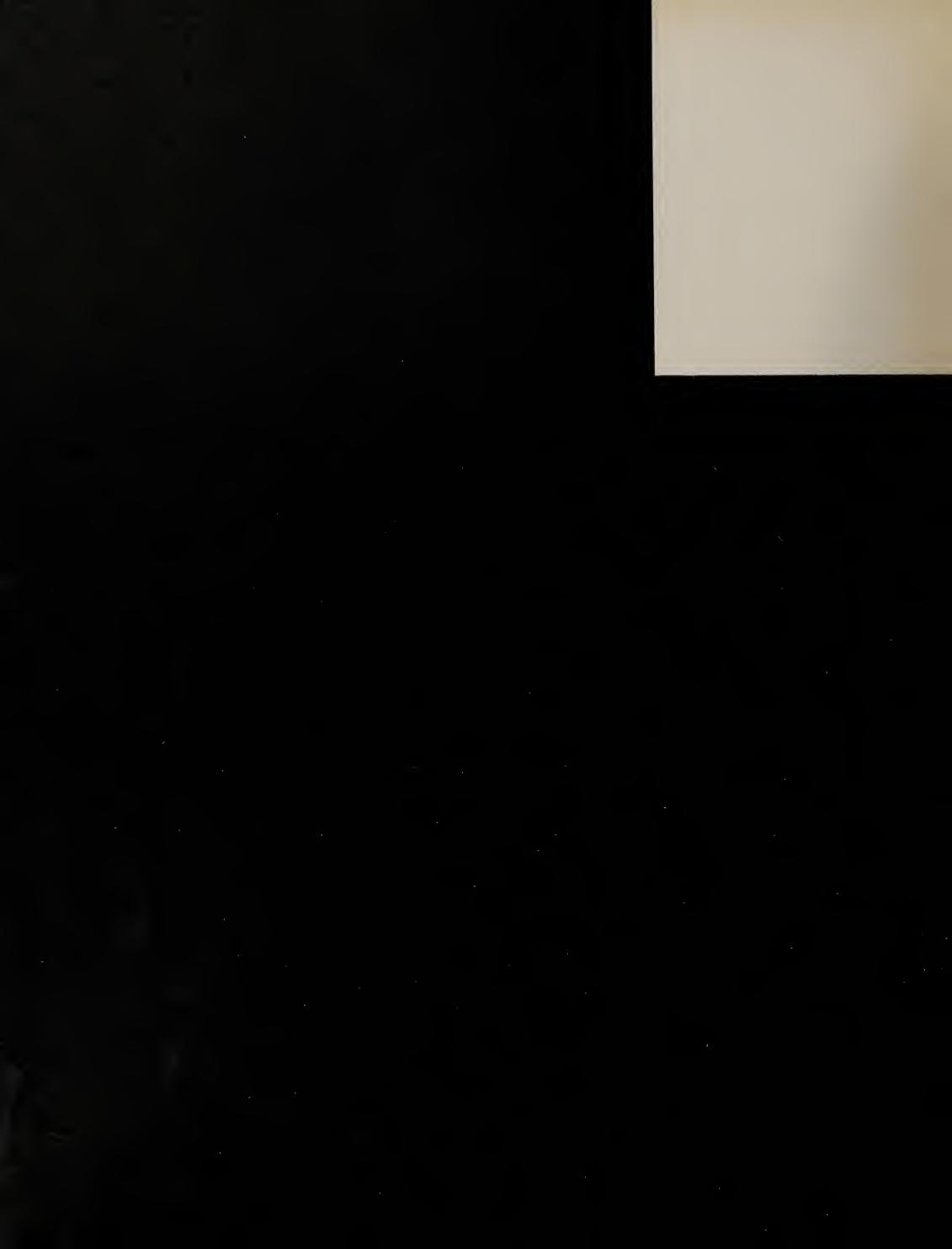
While the technical whizbang is of some interest, what really is going to concern IBM customers is the exact applicability and future of HPR. HPR is designed to work seamlessly with APPN networks. Thus, migration to APPN, per se, will not be an issue.

Unfortunately, most SNA customers have yet to be convinced of their need to migrate to APPN. The capabilities of HPR could tilt the balance. IBM is banking on this. HPR, however, is still only part of the overall IBM enterprise networking solution. To realize their much-needed LAN-interconnection requirements, IBM customers will need AnyNet in addition to HPR. Or they could elect to go with a conventional bridge/router solution. The latter approach is still the main threat to HPR and IBM — that customers, having given up on IBM, may seek an alternate path to their next-generation, multiple-protocol, broadband enterprise networks via bridge/routers.

Starting this summer, IBM will try to use HPR to stem this trend. For Big Blue's sake, let's hope time hasn't run out. While it is appearing late on the scene, HPR does have an impressive repertoire of capabilities that entitles IBM to claim that it really is the heir not just to SNA and APPN, but also to IP. The question is, will the market agree? As long as 30,000 of its current customers think so, IBM will be happy.

Guruge is an independent consultant specializing in internetworking and IBM network architectures. He can be reached at (603) 878-1303 or via the Internet at aguruge@mcimail.com.





OBJECT TECHNOLOGY

by Sam Greenblatt

OMG negotiates, then interoperates

When I open The American Heritage Dictionary and look up the word "negotiation," I find it is defined this way: "To confer with another in order to come to terms or reach an agreement." Standards bodies such as The Object Management Group (OMG) perform just

such a task. They negotiate standards; they don't create them by committee. That is, they discuss the issues and come to a resolution that ultimately benefits the industry at large. The Common Object Request Broker Architecture (CORBA) is an excellent example of a standard derived from such a process.

But most articles that describe this type of negotiation process are dangerous at best. Items taken out of context will mislead readers. John Rymer's opinion column in Network World titled "Vendor squabbling derails CORBA interoperability effort" (NW, April 11, page 38) is an example of such an article. Mr. Rymer seemed to indicate that negotiation among vendors in the OMG would jeopardize the standard-setting process. On the contrary: Negotiation assures that the process examines all viewpoints before coming to terms or setting a standard.

Currently, the OMG is negotiating to define CORBA 2.0, a specification that will provide interoperability among CORBA-based products. Interoperability is non-trivial yet development of CORBA 2.0 is still on target for completion by the

The OMG standard-setting process is a competitive one. OMG sends out a request for proposal and receives responses. Then

there is an open, very competitive evaluation process. A solution is then selected. It can be viewed as somewhere between a classical standardization process and an open marketplace, with an emphasis on supporting real competition and input from end users. Trivializing this effort is

capricious, futile and damages the cause.

Just as we are doing to define CORBA 2.0, OMG vendors have been negotiating to take part in a Distributed Application Showcase at Object World San Francisco. To find this unsettling is curious.

OMG never scheduled, advertised, promoted or even mentioned publicly an

interoperability demonstration. What OMG has been doing is planning in technical sessions, talking about and promoting among members a Distributed Applications Showcase that will be designed to show the world the maturity of the CORBA standard and the overall direction of the Object Management Architecture (OMA). We never planned these negotiations

There were meetings to try to show interoperability between the vendors' CORBA implemen-

tations. The concern among the vendors, including Candle Corp., was the logistics of an interoperability demonstration. No vendor wanted to create any public impression that any other vendor's solution would be the OMG standard.

OMG has only published a completion date of September 1994 for the CORBA 2.0 specification. The Distributed Applications Showcase is being used not as a CORBA 2.0 demonstration,

but to test interoperability between selected vendors on the show floor, including IBM with Hewlett-Packard Co., SunSoft, Inc. Candle, Iona Technologies, Ltd., Microsoft Corp., Digital Equipment Corp., Fujitsu Open Systems Solutions, and Expersoft Corp.

None of the vendors is seeking to gain an OMG advantage. As a software supplier, it is amazing to me to witness the level of cooperation.

The goal for the OMA, of which CORBA is a piece, is to provide a neutral distributed computing platform. We need competition at this level. The competition is over how two different CORBA systems interoperate with each other. Does anyone believe this is easy? Crossing such things as multiple protocol stacks, security domains, transports, and naming domains is something OMG is pushing to solve.

End users are worried enough as it is about wanting the distributed object world to settle

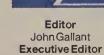
> down, and they are heartened, for example, by the lack of a battle between OMG and Microsoft despite some differences of approach. End users don't need

to see a fabricated new battle among the vendors they look to for solutions. This only muddies, not clarifies, the waters.

Don't whine, don't complain. Help us solve the biggest problem in distributed computing.

- Greenblatt is chief technical officer and vice president at Candle Corp. and an OMG board member. He can be reached on the Internet at sgreenblatt@candle.com.

NETWORK WORLD



NEWS

Assistant Managing Editor Paul Desmond Associate News Editor Bob Brown

ENTERPRISE INTERNETS Jim Duffy - Senior Editor

Michael Cooney - Senior Editor 6749 Jade Post Lane, Centreville, Va. 22020 Phone: (703) 830-8138 Fax: (703) 830-7963

Ellen Messmer - Senior Washington Correspondent Phone: (202) 879-6752

LOCAL NETWORKS

Caryn Gillooly - Senior Editor 5423 Gladewright Dr., Centreville, Va. 22020 Phone: (703) 266-1537 Fax: (703) 266-1543

Skip MacAskill - Senior Editor Christine Burns - Staff Writer

GLOBALSERVICES Joanie Wexler - Senior Editor

RAF Coordinator Bill Burch - Senior Writer Phone: (202) 879-6744

David Rohde - Senior Washington Correspondent

Phone: (202) 879-6758 National Place 1331 Pennsylvania Ave. NW, Suite 505 Washington, D.C. 20004 Fax: (202) 347-2365

CLIENT/SERVER APPLICATIONS

Adam Gaffin - Senior Writer Kevin Fogarty - Senior Writer 36 Baywood Lane, Yarmouth, Maine 04096 Phone: (207) 846-0601 Fax: (207) 846-6442

> **Managing Editor** Michelle Psyhogeos

Susan Champeny - Design Editor Susan Slater - Design Editor Terri Mitchell - Associate Design Editor

COPY DESK

Karen Moltenbrey - Associate Editor Jodi Cohen - Copy Editor Amy Koulouns - Copy Editor Laura Mascharka - Copy Editor

> **FEATURES Features Editor** Charles Bruno

Jim Brown - Managing Editor Stuart Melnitsky - Test/Reviews Editor Barbara Wierzbicki - Buyer's Guide Editor Susan Collins - Associate Features Editor Dana Thorat - Associate Features Editor Cheri Paquet - Assistant Features Editor

> **Contributing Editors** Daniel Briere, James Kobielus Mark A. Miller, Alan Pearce

Buyer's Guide Contributors Linda Musthaler, Josh Penrod, Joseph Skorupa, Currid & Co.; Mark Miller, DigiNet Corp.; Mark Gibbs, Gibbs & Co.; James Kobielus, Dyn Network Management, Inc.; Michael Goulde, David Marshak, Ronnie Marshak, John Rymer, Seybold Group; John Morency, Strategic Networks Consulting, Inc.; Daniel Briere, Chris Finn, Mark Langner, TeleChoice, Inc.; Marc

Test Alliance Partners Scott Bradner, Harvard University's Network Device Test Lab; Interdisciplinary Telecommunications Program (ITP), University of Colorado at Boulder; Mark Gibbs, Gibbs & Co.; National Computer Security Association; TeleChoice, Inc.

Robins, Robins Press, Inc.

Teletoons Phil Frank, Joe Troise

Assistant to the Editor Cheryl Crivello

Editorial Assistant Glenna Fasold

Colin Ungaro, President/Publisher Mary Fanning, V.P. Finance & Operations Nanci Farquharson, Office Services Manager

Network World Framingham, MA 01701 Phone: (508) 875 - 6400 Fax: (508) 820-3467 MCI Mail - 390-4868 Internet: network@world.std.com.

Letters

Words of wisdom

I found Anura Guruge's column "Investing in competitors could compromise IBM" (March 7, page 36) very informative and well presented. Too bad IBM has failed to heed his words of wisdom.

It really saddens me to see that IBM continues to be lost in the very industry it created. I think for IBM to announce support for Cisco Systems, Inc., Wellfleet Communications, Inc. and perhaps other vendors is a sign that IBM does not recognize the needs of the user.

In the old days, when the world was blue and end users needed direction, they could always turn to IBM, and the firm usually had an answer and solution. But the world has changed; Systems Network Architecture is not everybody's cup of tea and IBM fails to recognize that. Making 'me-too' statements of support for other vendors' products will only perpetuate IBM's exit from the industry it created.

I managed a data communications network in an IBM shop for more than 10 years. Today I work in a network environment that's dominated by Sun Microsystems, Inc. workstations, Novell, Inc. NetWare and Unix. When there is a problem, I must now fight through the fingerpointing alone because there is no standard bearer, no IBM, and no one to help eliminate the confusion.

OBJECT

WORLD

Frank McArthur Network consultant GigaByte Communications, Inc. Piscataway, N.J.

Not easy being green

Mark Gibbs' column "How green is the net machine?" (March 21, page 25) has me confused. I believe, though I have not bothered to prove it, that it is better to leave a PC running continuously, even overnight. The energy cost is offset by the hardware replacement costs.

I also thought the "green" power down to standby method would give me the benefit of a continuously running PC and a lower energy bill. Gibbs' eighth paragraph implies this is not true, and, while energy

costs will reduce, the benefit of a continuously running PC will evaporate. I'm especially concerned, since I will be picking up a "green" PC this afternoon for home use. At home, the PC will be on from 8 a.m. until 11 p.m.

Carl Vigil Co-owner **BCV**Enterprises Turlock, Calif.

Gibbs replies: The issue I was trying to bring out was that the objective of the Environmental Protection Agency's Energy Star program is to reduce power consumption. This means that they expect that when you go home, you switch your PC off. My point is that switching a PC on and off may well reduce its life span. 30, although you save money in energy costs, you have to spend money on the PC since it has to be replaced more often.

While the costs of the two scenarios might be calculated so that either the energy or replacement cost is greater, there is also the issue of contingent costs. It costs money to generate power, but this cost is hidden due to things such as tax relief and subsidies. Similarly, the true cost of PCs has to take into account things like cleaning

up the pollution from the heavy metals and plastics used in the manufacturing process.

I am not an analytic economist, so I really don't know how to perform such an evaluation. My concern is that Energy Star seems to be simplistic and until someone does a real, comprehensive cost analysis that includes consequential and contingent costs, there is the real danger that we'll be putting the cart before the horse.

Views on video

Regarding Thomas Nolle's column "Too many choices cloud LAN technology direction" (April 4, page

Mr. Nolle's lament about the delivery of motion video, including real-time videoconferencing not being supported by Sun Microsystems, Inc. and other vendors with their "variable-bit-rate, nonsynchronized, data-only ATM class of service "product offerings, is not justified today.

Real-time, two-way videoconferencing over variable-bit-rate, nonsynchronized, data-only networks (packet-switched networks) has been available since last year from See Letters, page 51



WHAT HAPPENS WHEN
YOUR BRANCH ROUTER
HANDLES
NON-LAN DATA?

Something's missing with most branch routers. While they're good at routing LAN data, branches have to handle non-LAN data - what other vendors call "non-routable" protocols. Motorola's new 6520 $MPRouter^{TM}$ can route any branch traffic: IP, as well as SDLC, BSC, async and other legacy protocols. And it works directly with your data center's routers. Motorola, maker of Codex and UDS products, takes the lead. Again. Isn't it time you got the whole picture? Call for a free brochure.

1 800 426-1212, ext. 550



NETWORK WORLD

MANAGING ENTERPRISE NETWORKS

A SURVIVOR'S GUIDE TO NETWORK AND SYSTEMS MANAGEMENT

Sponsored By:

NETWORK WORLD



Co-Sponsored
By:

z ć u G R A

ALLINK



STATE STATE OF THE STATE OF THE







RACAL

Racal-Datacom

SSDS

The Intelligent Network
Computing Company*

SunConnect

Synoptics Communications

Ungermann-Bass

BOSTON JULY 27-29

This Conference Gives
You Solutions to Your
Internetworking,
Client/Server and LAN
Management
Challenges

GET ANSWERS TO YOUR CRUCIAL NETWORK QUESTIONS!

- What to look for and avoid in choosing an open management platform. Save hours of research time and get your project questions answered now!
- How to set up the best organizational and planning models for networked systems management. Explore real user strategies for achieving maximum benefit for your organization.
- How to manage LANs across the enterprise and what new tools are easing that task. Get an in-depth look at the key management and technology issues faced by companies today.
- How to manage your desktops and networked Unix systems. Gain specialized knowledge that will belp you build and control your distributed computing environments.

LEADING EXPERTS WHO WILL HELP YOU TAKE CONTROL...

John Gallant

Editor in Chief

Network World

David Passmore

Conference Chairman Consultant Decisis, Inc.

David Mahler

Vice President of Marketing Remedy Corporation

95% OF LAST YEAR'S CONFERENCE ATTENDEES SAID THAT THEY PLAN TO ATTEND AGAIN!

Here are some of their comments:

- "Great insight and practical experience brought to center stage worth every minute!"
- "Excellent material and lots of it!! Clearly the BEST conference I've attended in years!"
- "User Stories were entertaining, insightful and brutally honest."
- This conference was all I expected and more, a terrific program."
- "The Technical Presentations and the Seminars were excellent!"

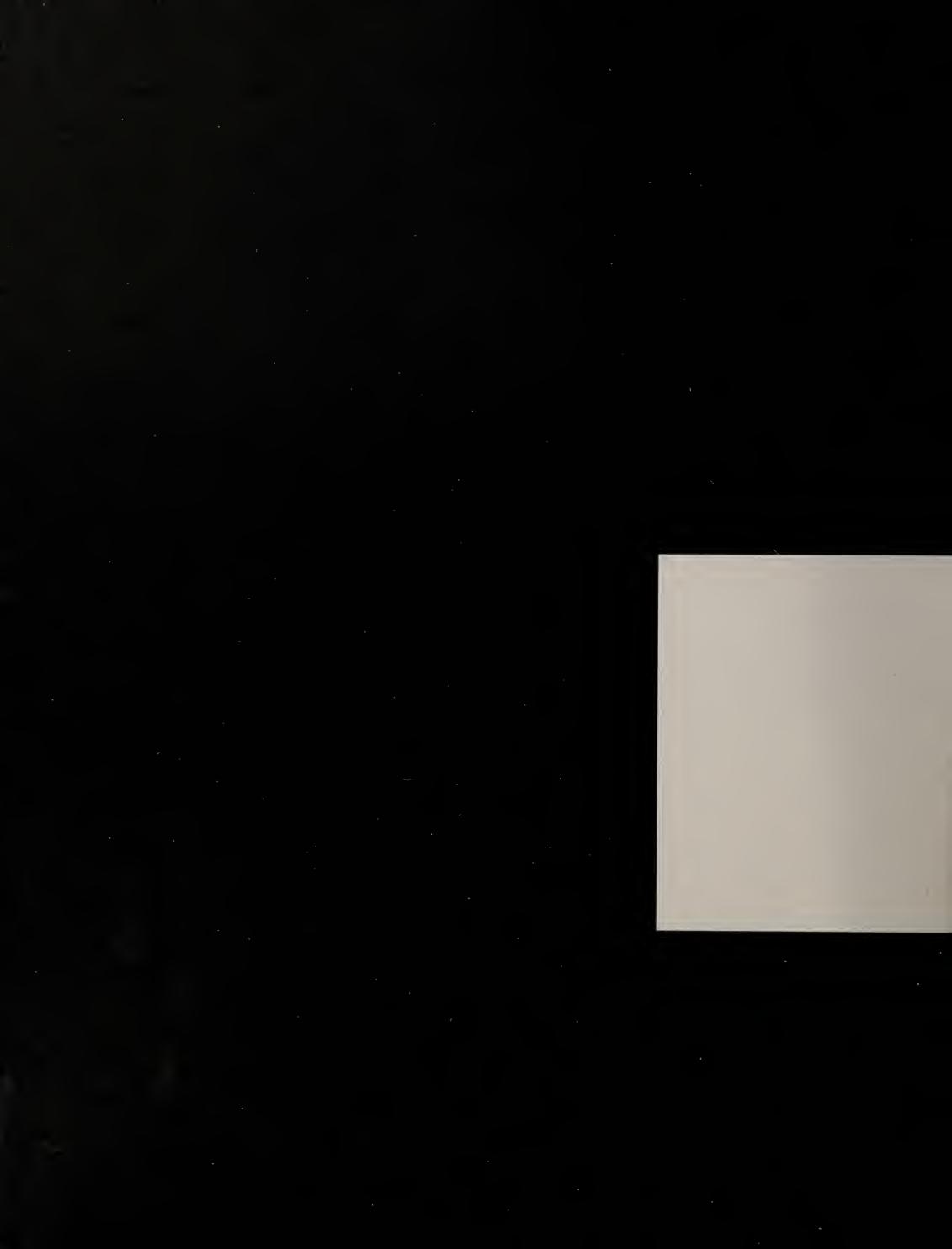
PLUS:

- Management Jeopardy: Special Session
- Keynote Sessions
- Intensive Seminars!
- Panel Discussions on Critical Network/Systems Management Issues
- See Products From Over 25 Leading Tool Developers. For Exhibitor Information Call (508) 470-3870.

Call (508) 470-3880 for more information and receive a free gift.

CXAXXOB







Backup relief for NetWare LANs Through its

By RONALD NUTTER



Product: ARCserve

Key findings:

- ► Well suited to large NetWare sites with heterogenous clients.
- Includes bundled support for DOS, OS/2 and Windows clients.
- Add-on modules can be purchased for additional workstation support that includes Macintosh and several Unix variants.
- The documentation is adequate, but misleading at times.

Server requirements:

► NetWare 3.X or 4.X

4M to 8M bytes of additional server memory

Pricing:

1,000-user license: \$9,295 500-user license: \$4,695 250-user license: \$2,395 100-user license: \$1,895 50-user license: \$1,695

Vendor:

Cheyenne Software, Inc. 3 Expressway Plaza Roslyn Heights, NY 11577 (800) 243-9462 We first took notice of Cheyenne Software, Inc.'s ARCserve in our Buyer's Guide on LAN backup systems (NW, Feb. 14, page 45). At that time, we placed it on our Short List of products, indicating that it deserved a closer look. Well, we decided to take our own advice.

In this review, we put ARCserve Version 5.01 to the test and found it a flexible, feature-rich local-area network backup solution well suited to large NetWare sites with heterogeneous clients as well as small, single-server installations. ARCserve is a NetWare Loadable Module (NLM) that runs on NetWare 3.X or 4.X servers and uses backup agents in the form of add-on modules to support heterogeneous client workstations

In light of the recent negative attention ARCserve has received (NW, March 9, page 1), we were prepared for the worst. What we discovered, however, was a product that worked well.

Although we ran into a few minor problems during the installation and were baffled by the documentation a few times, none of these problems proved too difficult to work around. We even went through typical technical support channels to get some of our questions answered. We had to wait on the telephone line for a while, but Cheyenne's technical support group was able to provide answers to our questions.

ARCserve offers a base level of support for DOS, Windows and OS/2 clients. For the net managers who need to accommodate additional file systems and file types, Cheyenne provides several add-on modules. With these modules, users can, for instance, back up Macintosh and several flavors of Unix files on the same tapes they use for their Net Ware file backups.

Currently, there is no support for Windows NT.

There are also add-on modules for both Oracle Corp.'s and Novell, Inc.'s SQL, which use data files that are always open. The ARCserve add-on modules use a Net-Ware command to stop writing data to the

main data file. Instead, all changes are written to a temporary file while the main data file is backed up.

Once the main data file is backed up, all changes from the temporary file are applied to the main data file. Sites that run either of these two database engines on their NetWare 3.11 server should apply the FATFIX.NLM from 311PTD.EXE to prevent database file corruption or deletion.

ONE SIZE FITS ALL

ARCserve performs full, incremental and differential backups. A full backup involves all of the files on the server and the target agents, then resets the archive attribute on the files. An incremental backup only backs up the files that have changed since the last full or incremental backup and resets the archive attribute on the files it backs up. A differential backup copies all of the files that have changed since the last backup, but it doesn't reset the archive attribute.

Differential backups are particularly useful in disaster recovery situations because the files can be restored from two tapes — the last full backup and the last differential. In contrast, to restore from both a full tape backup and an incremental tape backup combination, users must first restore their files from the full backup tape and then from each incremental backup tape in exactly the same order the tapes were used.

Cheyenne takes backup flexibility one step further by allowing users to back up data to multiple tape drives. Net managers don't have to worry about their backups stopping during the night when their tapes run out of space. Instead, they can define a backup group that contains more than one tape drive. Using a process called streaming, ARCserve continues the backup by using another tape drive in the group when the previous tape reaches capacity.

This ability to use multiple drives also means that users can back up several serv-

Continued on page 47

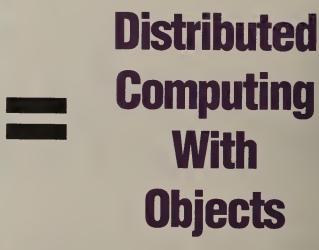
add-on modules, *ARCserve* allows net managers to tailor backup applications to meet the needs of their large, heterogeneous sites.

Network World teams with Object World.









Come to Object World San Francisco, July 25-29, 1994 and find out why object technology is the key to distributed computing.

Announcing a new conference program especially to focus on distributed computing with object technology.

More and more organizations have discovered that object technology (OT) is real. They're successfully using OT to solve problems in financial services, manufacturing, aerospace, telecommunications, defense, healthcare, transportation, and more.

Now Object World and Network World have come together to show you how OT can build better quality applications, shorten development time, reduce costs and improve performance. This new track is called the *Network* World Distributed Computing With Objects Track.

The Distributed Computing With Objects Track sponsored by Network World, the Newsweekly of Enterprise **Network Computing.**

This targeted program is designed for those who want to learn how to build distributed applications with object technology. It was designed to help you understand the core technologies and vendor strategies driving distributed object computing. Attend this exciting track for realistic ideas, insights, and proof that object technology is the key to distributed computing.

We've covered all the bases with Object World's additional conference tracks.

We offer over 60 other sessions and tutorials divided into the Technology of Objects, Objects in Business and Software Developers tracks to give you an comprehensive education in OT. Each track is organized in specific areas of interest so you can attend the maximum number of sessions that are important to you and your career.

Is distributed object computing a workable alternative? Can objects be used to link applications across multivendor platforms? The answer is an unqualified yes. And to prove it, Network World and the Object Management Group will

The live Network World Distributed Applications Showcase

use object request broker technology to showcase exhibitor's strategies for distributed applications—watch for it on the show floor.

FULL-DAY TUTORIALS

- Introduction to Client/Server Programming Using CORBA
- Understanding Distributed Object Computing
- Implementing Objects for Building Distributed Interoperable Applications—the Middleware Solution

CONFERENCE SESSIONS

- Planning for Distributed Computing with Objects: Challenge of the '90s and Beyond
- Distributing C++ Applications & Services— Concepts & Issues
- Getting Ready for Distributed Computing with Objects: The Next Paradigm Shift Bridging Client/Server and Object-Oriented
- Computing Distributed Object Technology—Products &
- Using CORBA to Integrate Legacy Systems Choosing a CORBA Implementation
- Designing and Implementing Truly Distributed Application Frameworks—A Middleware
- Case Studies: Success Stories in Distributed Objects
- Managing Distributed Object Development
- The Future of OLTP
- Planning for Large-Scale Distributed Object **Computing Environments**
- Distributed Object Computing and Business Re-engineering
- Building and Using Distributed Smalltalk & PDO—Case Studies in Distributed Computing with Objects

and over 60 other sessions . . .

Announcing the starting line-up.

is a first of its kind spectator event.

Choose from 3 full-day tutorials and 14 conference sessions and learn how distributed object computing is going to impact the strategies of vendors and users alike.

Take advantage of our half-time events—Open to all attendees.

While you're not attending the conference there are plenty of special events and bonus sessions to take advantage of every day:

KEYNOTES. Catch our two keynotes, including the encore of a three-hour presentation called *Object Strategies*, Two Years Later. Hear from the movers and shakers of OT including Chris Stone of the Object Management Group who has brought together Joe Guglielmi of Taligent, Steve Jobs of NeXT Computer, Philippe Kahn of Borland, Lee Reiswig of IBM, and Bud Tribble of SunSoft Inc.

BONUS SESSIONS. In addition to our conference program we are offering several 45-minute Bonus Session Series entitled Focus on OMG, Standards, Industries in Action, and Introduction to OT Concepts.

SPECIAL EVENTS. Our special events include Book Signings by noted industry authors, Solution Case Studies, and Exhibitor Seminars—three great ways to expand your OT knowledge.

Buy your conference ticket today and save up to \$200. Or get a FREE exhibits pass.

Register for the conference by June 17, and you'll receive up to \$200 off the price of admission to Object World San Francisco and a complementary 6-month subscription to Patricia Seybold's Distributed Object Computing Monitor. Plus, get a free exhibits pass—a \$50 value.

Call us at 800-225-4698 or 508-879-6700 for immediate information. Or return the attached coupon.

MED APPLICATE

Don't miss Object World—the only realworld event that focuses on the technical and business aspects of applying OT. And get set to learn about the latest in distributed computing with object technology.

Get set tor the Distributed Computing With Objects track
at Object World San Francisco.
Fill out this coupon and mail it to Object World, c/o IDG World
Expo, P.O. Box 9107, 111 Speen St., Framingham, MA 01701-

9107. Or call us toll-free at 800-225-4698. Outside U.S. dial +1508 879 6700. Can't wait? Fax us at 508-872-8237.

- Register me for my FREE exhibits pass—\$50 value. Register me for my FREE exhibits pass. And please send me more information about the conference

Reserve—without selected conference	obligation—my \$200 discount for e packages.
NAME	
TITLE	
ORGANIZATION	
STREET	
CITY	
STATE	71P/POSTAL CODE

Continued from page 45

ers or clients in parallel. For instance, using Novell's Target Service Agent (TSA) support, users can devise a strategy to maintain separate backups for different file systems, such as those for Unix, Macintosh and OS/2.

ARCserve also has add-on module support for tape changers and stackers, drives that load and unload tapes as they are needed. This module costs \$695 but is certainly useful for sites looking to more fully automate their large backups.

ARCserve provides a useful Auto-Pilot feature, which allows net managers to create automated procedures that specify the time of the

Taking the right steps

There are several things you can do to ensure a smooth installation of ARCserve. Download DOSUP.EXE and WINUP9.EXE from the Novfiles forum on CompuServe or via FTP from ftp.novell.com. Also, download the VPX118.EXE file from Novlib on CompuServe to get the latest VIPX.386 for windows. VIPX.386 is the virtual driver required for Windows to communicate with IPX when Windows is running in enhanced 386 mode. The version **Included** with NetWare might not include the most recent enhancements or bug fixes.

Next, upgrade the workstation that will run ARCserve Manager, the Windows control program for ARCserve. This workstation should run the latest versions of IPX.COM (or the Open Data-Link Interface drivers) and NET.EXE (or VLM.EXE). Check with the manufacturer of your network interface card to get the latest Multiple Link Interface **Driver (MLID) if you are using ODI or** the latest shell drivers if you are using IPX.COM. ODI is Novell, Inc.'s ODI that replaced IPX.COM. Call Cheyenne's bulletin board system or check its forum on CompuServe for the latest updates to the program and any release notes that may be available.

Before starting the installation of ARCserve on your server, we also suggest that you get updates for the local-area network and hard-disk controllers in your server. Also, get any updates to the Novell NetWare Loadable Modules (NLM) that you are loading on the server (CLIB, Streams and others). If you run into problems with the server abending after 'you install ARCserve, try changing the load order of the NLMs on the server.

A word to the wise: Don't try turning all the bells and whistles on at once. Just take it one step at a time until you feel comfortable with how things are working. And be prepared to do some work on your own since technical support may not be immediately available.

R. Nutter

backup, the data to be backed up, the tape drives to be used, the tape volumes be used and the type of backup (full, incremental or differential).

Auto-Pilot jobs can also be used to gain some of the fault tolerance benefits associated with NetWare SFT III, but without the additional hardware expense of Mirrored Server Link cards.

For instance, users can create an Auto-Pilot job that periodically — every two hours, for example — makes backup copies of all files that have been modified since the last backup. Although this approach may not be suitable for some sites that require true server mirroring, it may be an ideal solution for sites with less stringent requirements.

GETTING STARTED

The memory requirements for ARCserve can be a bit difficult to determine, especially for users who have little or no experience with server-based backup applications. Cheyenne's documentation doesn't mention an absolute minimum memory requirement. Instead, the installation guide recommends 4M bytes of random-access memory above what is already in the server. Of course, in some cases, this guideline may not provide much assistance. We suggest following the ''16M bytes of RAM to 1G-byte" rule.

Of course, keeping an eye on the cache buffers percentage in MONITOR.NLM isn't a bad idea. Both ARCserve and the server perform best when these buffers fall in the 70% to 80% range. It probably would be advisable to bring the server down once a month or so to defragment the memory.

ARCserve is installed from a client on the network. We encountered only a few problems during our installation.

The first problem was of our own making, but it did provide us with an opportunity to call Cheyenne's technical support, which has recently been drawing some complaints from

NDS Alert

ARCserve will

from a NetWare

4.X server, but

the NDS.NLM

target service

agent must be

loaded on the

ARCserve can

VVV

back up NDS

information.

server so

back up files

users. We selected the wrong Adaptec, Inc. Small Computer System Interface driver, which caused the tape software to abort its loading process. While calling Cheyenne, we waited on hold for 30 minutes, but we did get our problem resolved. Incidentally, when we called on a different day about a different problem, we waited on hold for 45 minutes, but, once again, we received an answer to our question.

The installation program insists on updates to .NCF files that have to do with the loading and unloading of Btrieve, the database ARCserve uses. The installation program didn't automatically flag the files so it could

change them and then reflag them when it finished.

We were able to get around the problem by opening a DOS session within Windows, manually changing the attributes on the files and then going back to the ARCserve installation window to continue the installation process. Still, we expect a more elegant solution from a package of this caliber. We encountered the same file flagging problem when the installation program insisted on changing two NLMs — BRMON.NLM and BREBUILD.NLM. We used the same work-around that we used for the .NCF file problem.

The installation guide indicates that the NLMs to be replaced during the installation

LAN backup for the enterprise DOS Windows OS/2 **ARCserve** Add-on workstation target service agents Add-on database agents Macintosh Solaris SCO Unix AIX ■ Btrieve DBagent Interactive Unix HP UX NetWare SQL UnixWare OSF/1 **DBagent** Oracle for NetWare DBagent Gupta SQLBase DBagent

DOS, Windows and OS/2 workstation support is bundled with ARCserve, but users can choose among several add-on workstation target service agents, including Macintosh and several flavors of Unix. Database sites can also make use of add-on agents to back up their database files.

GRAPHIC BY SUSAN SLATER

will be automatically renamed before the new NLMs are installed. However, this is not what happened. We had to manually flag the files. Once we did this, ARCserver renamed the old NLMS with a .CSI extension in case they need to be retrieved later.

The first time that we loaded ARCserve, our server abended. We really weren't surprised when this happened because we had been loading and unloading several NLMs recently and had probably fragmented the server's memory pool. When loading ARCserve for the

first time, it would be a good idea to defragment the server's memory by bringing down the server, exiting to DOS and restarting the server (see story, this page).

We did encounter a problem when exiting Windows after the installation. We ended up with either a blank screen with a flashing cursor in the upper left-hand corner or were greeted by a repeating message of Abort, Retry or Fail, which we couldn't respond to because the message kept repeating itself. To regain control of the client personal computer, we had to either reboot it or, in some cases, power it off and then on again.

Cheyenne's technical support representative suggested that we download VPX118.EXE from Novlib on CompuServe to update our VIPX.386, the virtual driver required for Windows running in enhanced 386 mode to communicate with Novell's Internetwork Packet Exchange (IPX). However, after we updated the VIPX.386 and restarted Windows, the problem persisted.

The second suggestion from technical support fixed the problem. Instead of loading BREQUEST.EXE from the WINSTART.BAT file, we loaded it before starting Windows. That appeared to fix the problem and had the added benefit of resolving another problem we were having with ARCserve. Until we made this change, the ARCserve Manager — the Win-

dows-based administrative control program — was unable to sense when the ARCserve NLM switched from backup to compare pass modes. In compare pass mode, ARCserve compares archived files (on tape) with the original files on the servers and workstation on the network.

TAKING THE WHEEL

ARCserve's Windows control program, ARCserve Manager, is an easy-to-follow point-and-shoot type of program. Most users will be able to perform an immediate backup of their servers once the software is installed. Backing up workstations and setting up Auto-Pilot jobs, however, will require some documentation reading as well as some time to become familiar with the software.

For those users with limited experience with backup applications, Cheyenne offers a one-day ARCserve training class, which, at \$395, is probably not a bad investment. The class won't instantly transform anyone into an expert, but it will provide good insight into using ARCserve.

Backing up data from workstations requires a bit of planning. The workstations must remain logged on to the network. Determining the right time to perform backups is also important, as network and server activity can substantially extend the amount of time required to complete a backup. Users should always factor in the time required to complete

Continued on page 50

\\ did it

We installed the ARCserve software on a DTK 386/33 server with 12M bytes of RAM and a 250M-byte disk drive running NetWare 3.11. Coned to our network were Net-

ware 4.01 and 3.12 servers, as well as Intel Corp. 80386 and 80486 PC

WHAT MAKES THE

WORLD CLASS
NETWORK SO

RELIABLE?

WHAT MAKES THE

WORLD CLASS

NETWORK SO

RELIABLE?

(YES OUR LINES ARE REDUNDANT.)



For years, if you wanted a reliable network, your only choice was to walk

away from the public switch and build your own private one. But not anymore. Because the line between public and private networks has just been blurred.

It's The World Class Network, the fiber-optic network from GTE.

It delivers voice, video and data on a single

line. Whether it's

fiber or twisted pair. In

fact, it can provide

a full array of

digital services

over the publicswitched network.

From low-speed

voice to high-speed

data circuits. Today.

For every 10,000 telecommuters who use The World Class Network, auto nitrogen oxide emissions will be cut by 580,000 pounds a year.

the beginning.

Our self-healing

But bandwidth is just

SONET rings monitor and reroute signals.

Immediately and automatically.

Reducing interruption and downtime to nearly zero. And since it's on the public network, you don't have to maintain and upgrade a private one. Which makes emerging technologies both accessible and affordable.

So The World Class Network
gives you all the reliability
of a redundant fiber-based

Not only is The World Class of a redundant, fiber-based
Network redundant, it
makes you redundant, so you
can be in two places at once.

of a redundant, fiber-based
digital network for a fraction

of what a private network would cost.

But then, we already said that.

For more information
about The World Class
Network, visit a GTE
demonstration center and
experience it firsthand. For
the center nearest you

and a free copy of The

On our redundant network, if trouble arises, you'll be rerouted automatically. With virtually no interruption.

World Class Network interactive diskette,



To get your free copy of The World Class Network interactive diskette, just call or, better yet, modem us.

call 1-800-GTE-4WCN.

Or you can access our

information through

your computer by dialing 1-800-GTE-4927.



It's amazing what we can do together."

Continued from page 47

compare pass in the calculations of the total time required to back up a server or a workstation. It is better to take a little longer to complete the backup and know that the information on the tape is good than to find that some critical files can't be restored.

When we used ARCserve to back up files from our workstations, we found that not all of the LAN drivers supported the large packet size - 1,024 bytes - that ARCserve likes to use. We used an Ansel Communications NE2100-clone network interface card.

We ran into a problem with the workstation

backup procedure hanging up after about 100M bytes had been backed up. The manual indicated that some LAN drivers can't handle packets larger than 1,024 bytes and that switching to 512-byte packets should fix the problem. Reducing the packet size to 512 bytes fixed the problem. However, using the smaller 512-byte packets increases the time required to complete a backup.

ARCserve also offers a password protection feature, which stops unauthorized users from restoring data from tape and, thus, gaining access to sensitive information.

Cheyenne provides telephone and facsim-

ile support for ARCserve users, as well as a CompuServe forum and a bulletin board. We traveled down a couple of these avenues. We called technical support twice for assistance during the product installation, placing these two calls on different days and at different times of the day. Although we were placed on hold for 30 and 45 minutes, respectively, we did receive answers to our questions.

We accessed the Cheyenne forum on CompuServe by entering "Go Cheyenne" at the CIS prompt and posted a question; we posted it on a Wednesday and had not received a reply by late Friday. We then placed a second message on the forum, which quoted our original question. On Saturday, we received a reply to our second message. Cheyenne also has a bulletin board system available for users to leave questions and download the latest patch files or other product information.

Cheyenne's licensing scheme for ARCserve is based on the number of users. A 1,000-user license retails for \$9,295, while a 500-user license costs \$4,695. Small sites can purchase five-, 10- or 25-user licenses for \$395, \$795 and \$1,395, respectively.

For the most part, we found the documentation helpful. However, users who are unfamiliar with the intricacies of server-based

The few problems we encountered with ARCserve didn't affect our overall assessment of the product.

backup may have some trouble following sections of the product manuals, which, at times, assume that users have a high level of knowledge about tape backup. Still, the manuals do an admirable job of

explaining the different types of backup — full, incremental and differential.

We did, however, run into a few problems. For instance, the documentation isn't clear about whether TSA support should be loaded before beginning a server backup. When we began a backup without loading the appropriate TSA (in our case, TSA312.NLM), we received an error message, but the backup continued. TSA support isn't discussed in as much detail as we would expect, given the importance it has for enterprise installations. TSAs are required for backing up a NetWare Directory Services server or a server that has a name space (Network File System, Macintosh or OS/2) loaded on one or more volumes.

In one section of the document, there are instructions for loading the DOSAgent TSR from within the system logon script. However, this can be dangerous, as loading a terminate and stay resident (TSR) while the logon script is running can potentially fragment workstation memory. A better solution is to exit the logon script and load the TSR from a batch file.

The few problems we encountered with ARCserve didn't affect our overall assessment of the product. ARCserve is an excellent package that will meet the backup needs of most large NetWare LANs. And its use of add-on modules allows net managers to tailor ARCserve to their sites' requirements.

Nutter is the director of technical services for 900 Support, Inc. He can be reached at rnutter@radiomail.net.

Calling all...

Long-distance 800-service providers

Network World invites you to participate in a survey for an upcoming Buyer's Guide on 800 services. If you provide long-distance 800 services and would like to receive a survey form, please call (800) 622-1108, Ext. 461 and leave a message for Cheri Paquet, assistant editor, or Barbara Wierzbicki, Buyer's Guide editor. Be sure to include your voice and fax numbers when requesting a product survey. Vendors must contact NW no later than May 2 to receive a surveyform.

The word on ATM.

The most comprehensive reports on ATM ever produced. Based on the latest information from ComNet's 1994 Conference.

ATM (Asynchronous Transfer Mode) is rapidly gaining status as the technology likely to underlie the national data superhighway. ComNet is the premiere computer networking and communications conference and exposition. Six (6) of the best conference sessions on ATM from ComNet 1994 have been produced into a concise series of six (6) comprehensive reports. Each one hour conference session has been completely transcribed, and then methodically edited by our team of ATM experts into a formal report.

The six (6) report series on ATM includes:

1) ATM: Strategies for Success

Featured Speaker: Dr. John McQuillan, McQuillan Consulting

2) Meeting the Challenges of High-Speed Multimedia (ATM) Networking

Featured Speaker: Dr. Jerry Marin, Manager of High-Bandwidth Networking, IBM

3) Network Management Solutions for ATM

Featured Speaker: Roger Kosak, Advisory Programmer, Network Systems, IBM

4) ATM as an Enterprise Backbone Replacement **Architecture for Multiplexing**

Chair: Frank Dzubeck, President & CEO, Communications Network Architects Panelists: R. Bruce McClure, Senior VP and GM, Ascom Timeplex

Desh Deshpande, Executive Vice President, CASCADE

5) ATM: Implications for the Enterprise WAN

Moderator: Rick Malone, Principal, Vertical Systems Group Panelists: Gail Smith, Director Worldwide Product Marketing, Motorola Codex Greg Crosby, Director Data Product Management, Sprint

Timothy Zerbiec, Vice President, Advanced Technology, Ascom Timeplex 6) Bringing ATM to the LAN

Chair: Robin Layland, Layland Consulting

Panelists: David Rubal, ATM Specialist, Cisco Systems

E. Robert Roth, Manager, Network Access Systems Marketing, IBM Michael Saverino, Senior Technical Manager, Concurrent Technologies

PHONE, FAX OR MAIL YOUR ORDER TODAY! ☐ Please send me all six (6) ATM reports for \$119. ☐ Please send me just the reports I've listed below for \$34 each. ___ Fax: ___ PAYMENT METHOD ☐ Fax/☐ Mail me the executive summaries from each of the reports. **Total Amount Paid:** (please add \$5 shipping and handling, MA residents add 5%, international orders add \$20) ☐ Please contact me for quantity discount information. ☐ Check payable to: The Applied Technologies Group Published and distributed for ComNet by: The Applied Technologies Group One Apple Hill, Suite 316
Natick, MA 01760 ☐ Credit Card: (VISA, MasterCard, American Express) Tel (508) 651-1155 Fax (508) 651-1171



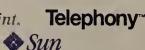












NETWORK WORLD

ascom Timeplex

Help desk

Continued from page 2

of NetWare. You would have to register with Novell's Developer Relations program by calling Developer Products and Programs at (800)

Once you are registered, you will qualify for technical support from Novell's Developer Relations Group for your programming related questions.

Our organization would like to add videoconferencing to an existing distributed multiuser editing system, which is used to support collaborating researchers throughout different cities. Do you know of videoconferencing software that will run on both Sun Microsystems, Inc. and Hewlett-Packard Co. workstations?

Michael Koch, Munich, Germany

Grant Paul, Jr., vice president of the International Teleconferencing Association Boston/ Hartford Chapter replies:

I know of only one collaborative, desktop

videoconferencing software product that is able to run on both the Sun and HP platforms in a Unix environment — InSoft, Inc.'s Communique.

Communique's core software architecture is the Digital Video Everywhere (DVE), which allows platform independence and supports multiple communication protocols. DVE's built-in video compression/decompression component also allows Communique to work with video boards that do not compress and decompress data.

However, when the software performs the compression function, it puts a lot of stress on the CPU, which must take the 90M bit/sec or more of digitized video data and "squeeze" it to lower data rates required for transmission. For better CPU performance, I recommend you off-load the compression/decompression function from the software to the hardware. For this, you might consider purchasing video boards that will do the data compression and decompression.

One line of video boards that performs compression and decompression, and works well with Communique is Parallax Graphics, Inc.'s PowerVideo products. These video

boards also support 24-bit color and contain an on-board Joint Photographic Experts Group (JPEG) processor for still and live video.

PowerVideo, which runs on the Sun platform costs \$5,495. PowerVideo700, expected to be released in May, costs \$3,995. Both of these PowerVideo products are offered at a discount if they are bought in large quantities. For more information about PowerVideo products, call (408) 727-2220 or send an information request on the Internet to info@paral-

If you are willing to sacrifice the quality of the video, you can use Parallax's or another manufacturer's video boards without compression at lower costs.

Communique software prices start at \$1,750 for Sun machines and \$1,625 for HP machines. You can also purchase InSoft's ConferenceKit, which contains a camera, microphone, the PowerVideo board and Communique software. Prices for the kit begin at \$7,995 for the Sun platform and \$6,375 for HP. For more information about Communique or ConferenceKit call (717) 730-9501 or send an information request on the Internet info@insoft.com.

Letters

Continued from page 41

suppliers such as Sun, InterVision Systems Corp. and View Point Systems, Inc.

The Packet Video Forum, based at MCNC in Research Triangle Park, N.C., is an industry group dedicated to the establishment of protocols and standard practices for videoconferencing over existing LANs, WANs and especially over the Internet.

Compressed motion video has been delivered on an ad hoc basis over the Internet for more than a year. The Internet carried a live feed from NASA with motion video coming from the space shuttle during the recent Hub-

bell telescope repair mission.

The official ISO/IEC 11172-1 international standard (the Moving Picture Experts Group-1 system specification) defines a packetized, digital bit stream for real-time delivery of compressed motion video and synchronized audio data. Products offering real-time delivery of MPEG-1 compressed video and audio over Ethernet, token-ring and other packetswitched networks have been commercially

available for more than a year. The high-definition capable MPEG-2 specification, which is rapidly approaching official standard status (estimated to be around the end of this year), will also specify packetized data streams.

It is the compressed video streams encoded by H.261-conforming video codecs, and codecs based on similar designs, that have difficulty when using packet-switched services. Even in that situation, several solutions to the technical problems are being investigated, with some demonstrating interesting and promising results. It's important to remember that the H.261 videoconferencing standard was explicitly designed to work using Integrated Services Digital Networks.

It also works well over other sufficiently high-bandwidth, circuit-switched telecommunications nets. There are other compression algorithms and encoding schedules that were designed to work well over packetswitched nets, MPEG-1 is one example. Use the right tools designed for the task at hand.

Alfred Riccomi Founder Multimedia pc Systems Richardson, Texas

Nolle replies: Mr. Riccomi has misunderstood my point with respect to Sun and ATM Adaptation Layer 5 (AAL5), a variable-bit-rate, nonsynchronized, data-only ATM class of service. Packet video is most certainly a good strategy and one I've endorsed in this column several times.

The problem that I'm citing with AAL5-only ATM is that it would deliver little that any other data-oriented local network technology could deliver.

If we are to adopt ATM, it must be because it does something that other technologies can't do. Video is the "killer application" for many ATM supporters, and AAL1 (isochronous) video is the form of video that ordinary data LAN technology can't transport.

Packet video would be, in my view, a superior way to extend videoconferencing to the desktop, because it could conserve both the LAN and display investments of users.

But if packet video is, in fact, the best solution, where does that leave the multimedia justifica-

That there is confusion about this matter in the minds of users (and vendors) is the point of my column.

NETWORK WORLD DIRECTORY OF SERVICES

Let your network diagrams speak loud and clear for you with Network World's NetDraw® clip-art software! Also now available is NetDraw Plus™ - astand-alone clip-art library complete with a powerful drawing application for Windows. Over 330 professionally drawn network graphics will help you communicate your networks more effectively.

Call 800-643-4668 to order your copy today! Fax-Back Document Code #10



With a subscription to NetText™ Online you can search three full years of every article printed in Network World and Computerworld! The answers to all your network questions are just a local phone call away. Our easy to use communications software for NetText™ is available for MAC, DOS or Windows platforms.

Call 800-643-4668 to subscribe today! Fax-Back Document Code #25

YS E M I NARS

Network World Technical Seminars are one and two-day, intensive seminars in cities nationwide covering the latest network technologies. All of our seminars are also available for customized on-site training. Our current seminars include; ivetvvare 4.x Strategic Migration, Doing Business on the Internet, and Understanding Broadband Networks.

Call 800-643-4668 to register today! Fax-Back Document Codes #60 & 80

REPRINTS

Publicize your press coverage in Network World by ordering reprints of your editorial mentions. Reprints make great marketing materials and are available in quantities of 500-10,000.

To order contact Reprint Services at 612-582-3800 or 315 5th Ave. N.W., St. Paul,

$\nabla B \cdot O \cdot O \cdot K \cdot S$

Published by IDG Books, our newest book; Network Security SECRETS provides you with vital expertise on data protection, passwords, encryption, viruses, remote access and more! Call 800-762-2974 to order your copy today! Fax-Back Document Code #35



NetACCESS

Use NetACCESS to download demonstration copies of products offered by Network World advertisers for a trial run. To sample the variety of demos, use any personal computer to reach our BBS at 508-620-1178. (8N1, up to 9600 bps)

Our instant fax-back service delivers information on many of the above products. Dial 800-756-9430 from your touch tone phone and use the appropriate document code to have information faxed right back to your fax machine!

Network World Advertising

Colin Ungaro - President/Publisher Thomas J. Wilson - Vice President, Advertising Director Eleni Brisbois, Sales Assistant 161 Worcester Road, Framingham, MA 01701 (508) 875-6400/FAX: (508) 879-3167

Sales Offices

BOSTON

Donna Pomponi, District Manager 161 Worcester Road, Framingham, MA 01701 (508) 875-6400/FAX: (508) 651-1853

NEW YORK/N. NEW JERSEY Carol Lasker, District Sales Manager

Tom Soevyn, Manager, Demographic Editions 365 W. Passaic St., Rochelle Park, NJ 07662 (201) 587-0090/FAX: (201) 712-9786

S. NEW JERSEY/PHILADELPHIA/D.C. Jacqui DiBianca, District Manager Patricia DiBiase, Sales Assistant

365 W. Passaic St., Rochelle Park, NJ 07662 (215) 834-1390/FAX: (201) 712-9786

CHICAGO

Dan Gentile, District Manager Anna Gabriel, Sales Assistant 1011 E. Touhy Avenue, Suite 550 Des Plaines, IL 60018 (708) 297-8855/FAX: (708) 827-9159

SAN FRANCISCO Lisa Hall, District Manager Sandra Kupiec, District Manager Paula Connor, Sales Representative Beverly Davis, Sales Assistant Brian Weiss, Sales Assistant 894 Ross Drive, Suite 200, Sunnyvale, CA 94086

(408) 541-8630/FAX: (408) 541-8640 Kim Schackel, CBC, National Acct. Mgr., Western Region 2443 Fillmore Street, Suite 427, San Francisco, CA 94115 (415) 928-3589/FAX: (415) 776-2475/Irvine: (714) 250-3006

ATLANTA

Don Seay, District Manager Terry Sanders-Prentice, Sales Assistant 1400 Lake Hearn Dr., Suite 330, Atlanta, GA 30319 (404) 394-7509/FAX: (404) 255-5123

> **LOS ANGELES** Julie Haws, Sales Representative

Tracy Pennell, Sales Assistant 2171 Campus Drive, Suite 100, Irvine, CA 92715 (714) 250-3006/FAX: (714) 250-4881

DIRECT RESPONSE ADVERTISING Response Card Decks/ActionCenter/Marketplace

Joan Bayon Pinsky, Sales Director Clare O'Brien, Senior Account Manager Toni Clayton, Account Executive Jolene Springfield, Sales Assistant (508) 875-6400/FAX: (508) 628-3976

RECRUITMENT ADVERTISING Pam Valentinas, Senior Account Manager Christie Sears, Operations Coordinator (508) 875-6400

ADVERTISING OPERATIONS

Karen Wallace - Manager of Advertising Operations Cathy Sampson - Sr. Advertising Account Coordinator Ann Lewis - Advertising Account Coordinator Deborah McKenna, Advertising Billing Coordinator (508) 875-6400

MARKETING

Evilee Thibeault - Vice President Marketing Joanne Wittren - Marketing Services Manager Kristin Schiller - Marketing Specialist/Promotion

SPECIAL PROJECTS

William Reinstein, Director of New Business Devlp Debra Mahler, Product Specialist Christie Sears, Operations Coordinator

RESEARCH

Ann MacKay - Research Director CIRCULATION

Deborah Winders - Vice President Circulation Richard Priante - Director of Circulation Renee Visconti - Fulfillment Manager Bobbie Crusc - Customer Service Rep.

PRODUCTION

Ann Finn - Production Director Greg Morgan - Production Coordinator FAX: (508) 875-3090

REPRINTS

Donna Kirkey - Reprint Manager/Graphic Designer LIST RENTAL SERVICES Kelly Martin - List Rental Sales P.O. Box 9151, Framingham, MA 01701-9151 (508) 879-0700

NETWORK INFORMATION SERVICES

Jeff Pennett - Vice President Network/Production Services Jack McDonough - Network Manager Anne Nickinello - Production Systems Manager

DISTRIBUTION Bob Wescott - Distribution Manager (508) 879-0700

IDG

Patrick J. McGovern - Board Chairman Walter Boyd - President William P. Murphy - Vice-President Finance

Network World is a publication of IDG, the world's largest publisher of compuler-related information and the leading global provider of information services on information technology. IDG publishes over 194 computer publica-tions in more than 62 countries. Forty million people read one or more IDG publications each month. Network World contributes to the IDG News Service offering the lastest on domestic and international computer news.

Fast Info with FaxNET

For **FREE FAST** Information about the following ActionCenter Advertisers:

- 1. Call 1-800-664-8271
- 2. Wait for prompt and follow instructions
- 3. Key in advertisers "5" digit number listed below
- 4. Requested information will be faxed to you immediately

Amerinet	34250	Cylink Corp.	34070	Newtek Education	34200
Bay Area Teleport	34010	Dataprobe Inc.	34080	Source Comm Corp.	34270
Brixton Systems	34210	Frontier Technologies	34260	Spectra Systems -	34230
Coastcom	34190	InVisionSystems Corp.	34110	Spry, Inc.	34280
Cogent Data Tech	34060	Learnkey Inc.	34120	Transition Engin.	34240
Communication Devices	34030	Nevtoct	3/170		

There is no cost to you to receive this information. Reader Service Cards will be inserted in the April 4th and April 18st issues if you wish information about Action Center Advertisers mailed to you.

CONNECTIVITY



WE'RE TALKING 5250 EMULATION FROM ANY PLATFORM.

Access your AS/400 applications and databases from virtually any platform, with Brx5250 emulation software from Brixton Systems.

Brx5250 works with • Sun Solaris (SPARC & x86) • RS/6000 • HP-UX
• SCO Unix • UnixWare • Windows 3.1 • and Windows NT.

Move to open systems while leveraging your legacy hosts. Get full emulation capability, including print and file transfer. Plus a feature-rich GUI with windows, menus, and cut-and-paste capability between applications.

Leaders in software connectivity. The Brx5250 is part of a complete family of Brixton software that can link all your TCP/IP and SNA users, networks, and databases. Since it's all software, you're not tied to specific hardware. You build on your existing resources, and you keep your future hardware options completely open.

Find out why nearly 100 of the Fortune 500 are connecting with Brixton. Call today. Our 5250 emulation is a lot more than just talk.

TALK TO US.

1-800-BRI**X**TON

rixton Systems, Inc., 125 CambridgePark Drive, Cambridge, MA 02140 USA

All trademarks are the property of their respective owners.

Circle Reader Service No. 139

CONNECTIVITY

NEW SUPER TCP/NFS 4.0 For WINDOWS.



Super TCP/NFS "outclasses" all other TCP/IP products. PC Week

Super TCP/NFS rated "best." UNIX World

- Lan Magazine made it "Product Of The Year."
- Data Comm Magazine gave it its coveted "Tester's
- Data Comm
 TESTER'S
 CHOICE



ChoiceAward." I UnixWorld Magazine rates Super TCP/NFS "best." Now Frontier Technologies has made it even better. Introducing new Super

TCP/NFS 4.0 for Windows, the only 32-Bit VxD TCP/IP, NFS, NetBIOS product that requires zero DOS memory while providing maximum performance.

Frontiers' Super TCP/NFS 4.0 is fully integrated into

Windows and Windows for Workgroups, so you get full Windows functionality at all times.

When you compare Frontier Technologies' ease of instalation and use, extensive third-party sup-



port of databases, X-servers and emulators, you'll know why Frontier is the technology leader.

Call and find out how far ahead we really are.

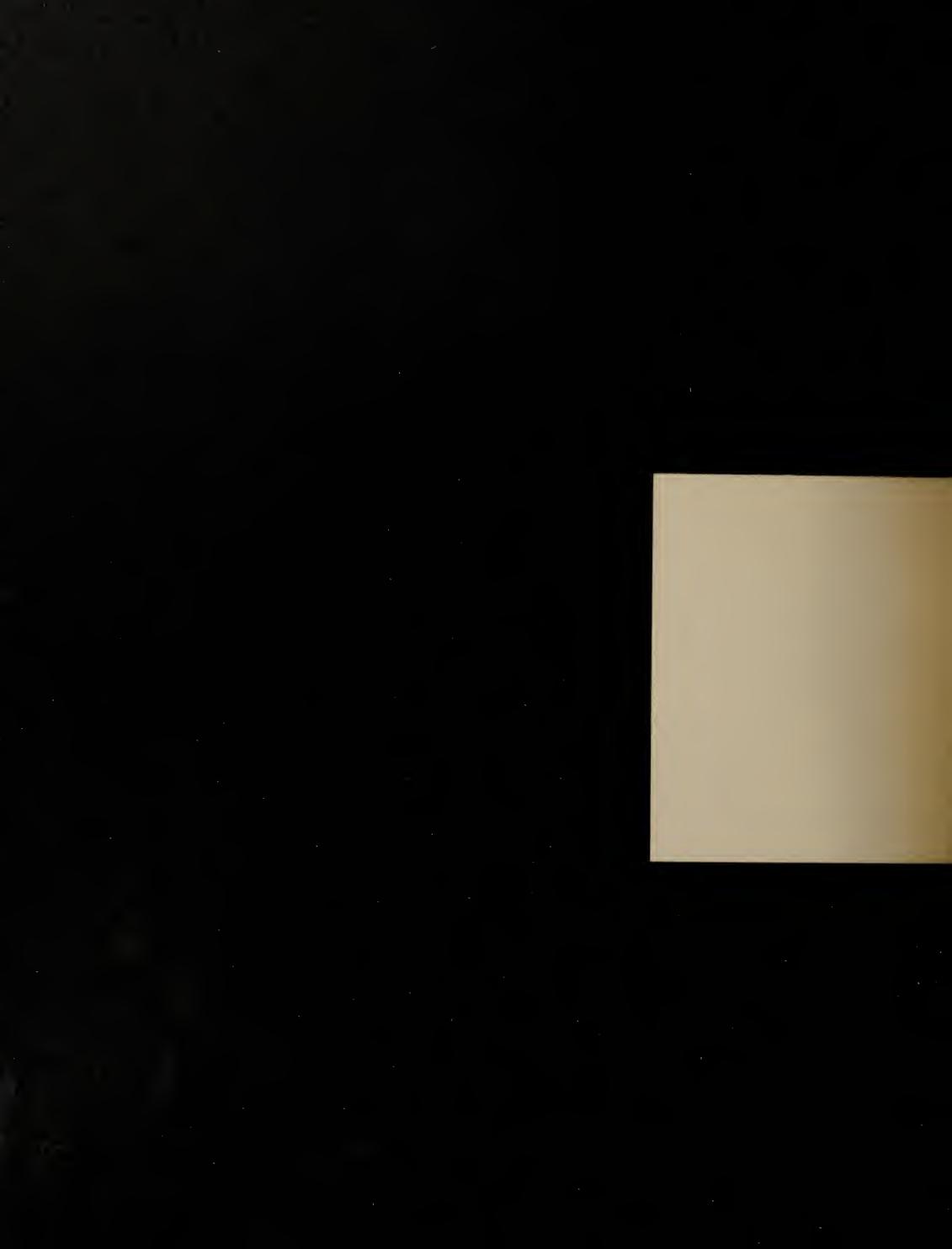
FAX 414-241-7084 EMAIL

CALL 414-241-4555 BBS 414-241-7083 Tronier Technologies Corporation

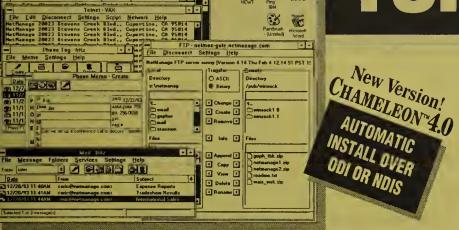
Frontier Technologies Corporation, 10201 N. Port Washington Road, Mequon WI 53092

1994 Frontier Technologies Corp. All Rights Reserved.





TCP/IP for Windows



Implemented as 100% DLL (not a TSR) Requires only 6KB of base memory Installs in 5 minutes

More Windows applications than any other TCP/IP package Gopher Client, TN5250, LPR/LPD

Applications:

Telnet (VT100, VT220, TVI), TN3270, TN5250, FTP, TFTP, SMTP Mail with MIME, News Reader, PROFS Mail, LPR/LPD, Ping, Bind, Finger, Whois, Gopher, Phonetag, Scripting, Statistics, Custom, SNMP Agent

Developer Tools:

- Windows Sockets API
- Berkeley 4.3 Socket API
- ONC RPC/XDR
- WinSNMP API

Circle Reader Service No. 141



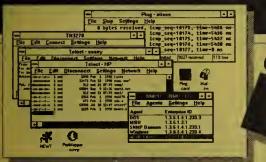
For overnight delivery call:

MIME Support in Mail, Scripting



NetManage, Inc. 10725 North De Anza Blvd., Cupertino, CA 95014 USA Fax (408) 257-6405

SNMP for Windows







Extensible SNMP agent for Windows

- Includes MIBII, Workstation, Windows and DOS agents
- Dynamic registration of multiple agents, managers, and proxies
- WinSNMP API developers kit available
- Compatible with any SNMP manager
- Implemented as 100% DLL
- Requires only 6KB of base memory
- Free with NEWT, Chameleon, and Chameleon NFS

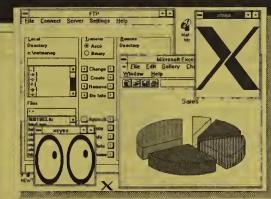
For overnight delivery call:



10725 North De Anza Blvd., Cupertino, CA 95014 USA Fax (408) 257-6405

Circle Reader Service No. 142

X for Windows



New Version:

- Compliant with X11R5 Standard
- Exploits full 32-bit architecture
- Takes only 10 minutes to install both X and TCP/IP
- Implemented as a 100% DLL (not a TSR)
- Requires only 6KB of base memory
- XRemote, super fast dial-up option

2 Products In 1 **Optimized Pair**

For overnight delivery call:



NetManage, Inc. 10725 North De Anza Blvd., Cupertino,

CA 95014 USA Fax (408) 257-6405

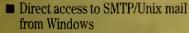
SMTP Mail for Windows







May 1993



- POP client and server included
- LAN and serial link to the Internet
- Address book with groups (mailing lists)
- Multiple message viewing
- Point-and-click operation
- Implemented as 100% DLL
- Requires only 6KB of base memory
- **FREE** with Chameleon and ChameleonNFS

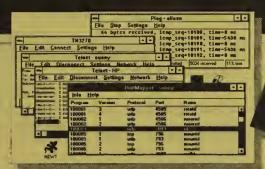
MIME Support for attachments Action Rules for filing and forwarding

For overnight delivery call:



NetManage, Inc. 10725 North De Anza Blvd., Cupertino, CA 95014 USA Fax (408) 257-6405

NFS for Windows







First and only NFS client and server for Windows First and only print client and server for Windows

- Network drives are mounted from within Windows
- Network printing in the background
- Up to 24 network drives
- Implemented as 100% DLL
- Requires only 6KB of base memory
- Included in ChameleonNFS

For overnight delivery call:

NetManage, Inc. 10725 North De Anza Blvd., Cupertino, CA 95014 USA Fax (408) 257-6405

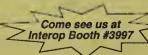
AIR NF

Part of the AIR SeriesTM TCP/IP Applications for Windows

- The Easiest-to-Use Applications
- Works over any TCP/IP
- **Includes Internet Access Applications**
- FREE Novell® & Microsoft® TCP/IP!





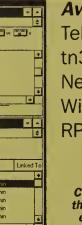


"Drag and Drop ftp"

The first ftp integrated into Windows File Manager!

Circle Reader Service No. 146

EXPERIENCE TCP/IP APPLICATIONS EXCELLENCE!



Available:

Telnet, Network File Manager (ftp), tn3270, NFS, FTP/RCP Servers, Mail, News, Gopher, LPR, X-Windows, WinSock, SNMP, SLIP/PPP, NetBIOS, RPC for WinSock

Call today and mention this ad for a free 30-day evaluation or trade in your TCP/IP package for a 50% discount!



777-9638

316 Occidental Avenue South Seattle, WA 98104 Fax: 206.447.9008 info@spry.com

SOFTWARE TRAINING VIDEOS/NOVELL NETWARE



Software

Tim Gendreau Certified NetWare instructor and contributing author of



Montgomery author of Networking with LANtastic and Running Windows



Tom Sheldon Certified NetWare Engineer, & author of Windows 3 Made Easy and NetWare 4: The Complete Reference.

Increase Network productivity! This ten tape series will help prepare you for CNA testing.

NetWare Basics Teaches what hardware & software components are needed for a network, how to log-in, create & maintain a NetWare directory as well as how to create, modify, and

delete network & search drive mappings. 70 min. **NetWare Security** Covers the basic concepts of NetWare security including passwords, rights security, inherited rights masks, trustee rights, attributes & file server security. 67 min.

Menu & File Server Utilities 1 Explores the menu driven utilities of NetWare. Learn how to create & manage users and groups in SYSCON utility and supervisor options of SYSCON. 66 min.

Menu & File Server Utilities 2 Covers menu utilities like FILER, SESSION, DSPACE, & SAL-VAGE. Learn about file server utilities, NetWare Loadable Modules (NLMs) & Remote Console utility. 106 min.

NetWare Printing Discover the printing services available on NetWare. Learn about utilities like PCONSOLE, CAPTURE, & NPRINT, plus how to create, configure & maintain the print server. 83 min.

Introduces NetWare users to System, User, & Default login scripts. Learn order of execution, the commands, & advanced tips for creating login scripts. 74 min.

Custom Menus *125.00 ut how to customize the Netware en Learn how to create, maintain, & execute menus. 33 min.

Advanced Administration Learn about workstation configuration files Shell.CFG & Net.CFG, file server performance, & memory pools. 60 min.

Advanced Printing Covers printing performance, advanced printing configurations, & print definitions. 60 min.

Maintenance & Utilities *125.00 Learn about RConsole utility, S backup, bindery maintenance & repair, & much more. 90 min.

Combination - 10 tapes

\$995⁰⁰

Users Guide to NetWare 4.x Tom Sheldon leads the inexperienced user through a simple overview of networking to help remove the mystery of networking. 60 min.

NetWare 4.x Concepts Learn about the NetWare Directory Services, Object Management Features, Security & Access rights, installation, and much more. 2 hours

NetWare 3.X Installation comin \$125.00

installing WordPerfect 5.1 on a Novell Network 101 min \$125.00

Effectively Using \$125.00 Your Novell Network 101 min

LANtastic Videos

LANTASTIC Basics 50 min. Management & Security 30 min. **\$59.95** Server Config. & Performance 65 min. \$59.95 Network Printing 40 min. \$59.95 Networking Windows 60 min. ***59.95** \$74000 **Combination** - 5 tapes

Credit Cords, checks, money orders, and purchase orders occepted. Add \$5 shipping per arder, Utoh residents add 6.25% tax. Moil or fox arders to:



FAX 801-224-821

LearnKey, Inc. 93 S. Mountain Way Dr.-Rm 9 Orem, UT 84058 801-224-8210

Over 100 titles to choose from! WordPerfect, Excel, Word, Lotus, Windows, DOS, and many

write, or FAX for a FREE Catalog!

Call,

Circle Reader Service No. 147

ACCESS CONTROL

2 for the price of 1

Secure Access Control

Dial Network Management



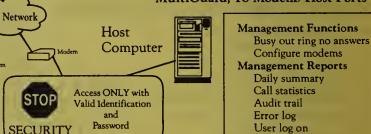
QuadGuard, 4 Modem/Host Ports





MultiGuard, 16 Modem/Host Ports

Status report



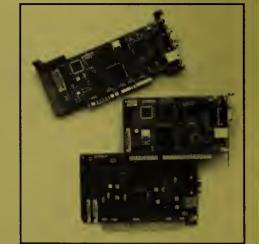
Communication Devices Inc. 1 Forstmann Ct., Clifton, NJ 07011 T 1 800 359 8561 FAX 201/772-0747

Circle Reader Service No. 148

ADAPTERS

AWARD-WINNING **TOKEN RING ADAPTER CARDS**

- * Proteon ProNET-4/16 Plus adapter cards - ISA, EISA, Micro Channel bus support
- * Absolute dependability- Backed with a Lifetime Warranty
- *Interoperability Guarantee - Broadest range of NOS support
- *Software configurable for easy installation
- * Performance awards from DataCommunications and InfoWorld



Call 800-830-1300 for the location of the reseller nearest you.

HIGH SPEED CONNECTIVITY!



Now you can have high speed networking and connect to everything in your enterprise—with **emaster** and WinNET plus.

Cogent's innovative Predictive Pipelining™ makes **EMASTER+** Ethernet adapters up to 50% faster than the competition. And, we've added WinNET plus so you can connect to printers and servers across all your networks simultaneously.

The **EMASTER**+ series is a complete line of ISA, EISA, Micro Channel, PCMCIA, and Full Duplex Ethernet (FDE) adapters for a wide range of network platforms.

Make the **EMASTER+** connection for as low as \$113. WinNET plus included*

*sold separately for \$89









1-800-426-4368 @1994 Cogent Data Technologies, Inc. All rights reserved. All trademarks are the property of their respective owners. 175 West St., P.O. Box 920 Prioay Harbor, WA 96250 * 200-378-2929.

cogen

Banyan VINES® • Novell NetWare®

Windows™ for Workgroups

Apple Macintosh® • LAN Manager™

DEC PATHWORKS for DOS™

TCP/IP • NFS • and more!

Circle Reader Service No. 150

ATMTESTEQUIPMENT

ATM Test Solutions



Adtech is delivering ATM test equipment to some of the biggest names in the ATM business. Call us, we are interested in helping you with your ATM testing needs.

(808) 941-0708 or Fax (808) 946-1300

1814 Algaroba Street • Honolulu, Hawaii 96826

Circle Reader Service No. 151

BRIDGE/ROUTER

SOURCE-COMM CORPORATION

the reSOURCEful networking company ™

Our XANboxº/1103 Router may be remote - but at \$995, it's not out of your reach!

Power Port! Port? Port? LAN

Basic model at \$995 includes:

- Ethernet LAN port
- Three WAN ports, up to 64Kbps each • IP and IPX LAN protocols
- PPP, SLIP and HDLC WAN protocols
- SNMP and XANman management

Token Ring model available Q3, '94.

Options (available Q3, '94):

- Additional protocols (NetBIOS, Appletalk, Frame Relay, X.25)
- T1 speed on one WAN port

See us at NETWORLD+INTEROP 94 Las Vegas, May 46 Start-Up City' - Booth 28

For more information and the name of your nearest dealer, call, write or fax: Source-Comm Corporation, 25020 West Avenue Stanford (Unit 180), Valencia, CA 91355 Fax: (805) 294-0598 Phone: (805) 294-0555

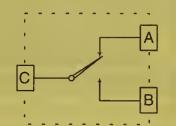
Circle Reader Service No. 152

DATASWITCHING

"A Switch in Time Can Save Your Line"

NEW Data Switches

Automatic or Remotely Controlled by: Modem - Telephone Paging System - PC



Dataprobe, the leader in unique data switching and alarm reporting systems has expanded and introduced many new products, features and functions. Switching logic can now be progammed using data and time qualifiers in addition to our Exclusive Fallback Truth Table

Call or send for our Applications Catalog



11 Park Place / Paramus, NJ 07652 Phone: 201-967-9300 Fax: 201-967-9090

Circle Reader Service No. 153

DIGITAL PRIVATE LINES

RELIABLE, HIGH SPEED, COST EFFECTIVE DIGITAL DATA COMMUNICATIONS

DIGITAL TRANSMISSION SPEEDS

DDS: 2.4, 4.8, 9.6, 19.2, 56, 64 KBPS

FRACTIONAL T1

FULL T1

INTEREXCHANGE PERFORMANCE

ERROR FREE SECONDS:

99.99%

AVAILABILITY:

99.98%

180 Grand Avenue Suite 1000 • Oakland, CA • 94612

O

NETWORK O

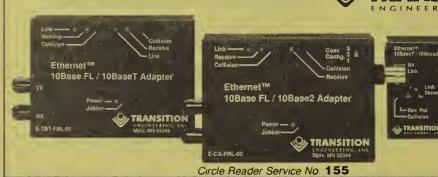
DATA

Quick Change Artists.

Interconnect Media With Confidence.

The fact is, there's more than one way to wire a network. Even within networks, there's often the need to interconnect media or devices with other media types. Our media converters provide a quick, easy-to-install way to switch between fiber, coax and twisted pair, perfect for system upgrades to fiber or 10BaseT. Anywhere you need to switch from one media to another, Transition Engineering has the media converter to fit the application.

For more information on how our quick change artists can make your cabling problems disappear, call us for the name of the distributor in your area at 1-800-325-2725.



FDDI/DTP

Networking big files requires a...

BIG FDDI PIPE!

If your network is a critical part of your operation, we need to talk.

Network users may be spending more time waiting for the network to catch up than producing. Spectra's affordable line of FDDI products for networking DTP and multimedia graphics computers can increase your network performance to levels that will allow you to move data between machines at up to 20 times faster than your Ethernet. Give your network users the bandwidth they deserve today!

NICs

• Macintosh Nubus

• EISA/ISA PC

• Workgroup

Concentrators

• Premise Wide

Bridges • Ethernet/FDDI

Spectra products support copper wiring as well as high performance optical fiber.



Phone: 404-410-7803 or FAX: 404-410-7815

or use NWW's FaxNet to get additional information.

Reseller inquiries are encouraged.

INSTANT WIRELESS COMMUNICATIONS



AirLinks go where wires won't!

AirLink™ digital wireless modems can transmit data, voice, video, or anything else you want to send, up to 30 miles away. They're perfect for that small remote site, tetherless videoconferencing, or a cost-effective, quickly deployed link. Speeds range from 1.2 kb/s to fractional T1. No license is necessary. And you can count on your data arriving at its destination; our users all over the world have reported their wireless links are more trouble-free than their wired links! So next time wire is

too much hassle or too much money for the application, call the company that pioncered digital wireless modems. Cylink Corporation, 310 North Mary Avenue, Sunnyvalc, California, USA, 94086. Toll-free (USA): 800-533-3958, FAX: 408-720-8294, Telephone: 408-735-5800. For instant, faxed information, call 408-735-6614, then enter 301. Worldwide sales & support.



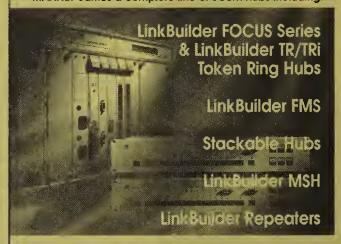
© 1994 Cylink Corporation
Cylink is a registered trademark, and AirLink is a trademark of Cylink Corporation.

Circle Reader Service No. 158

INTEGRATOR/HUBS AND ADAPTERS

LOWEST PRICES • HIGHEST AVAILABILITY and MOST COMPLETE TECHNICAL SUPPORT for all 3Com products, including CENTRUM and SYNERNETICS!

MAXNET carries a complete line of 3Com hubs including:



CALL FOR THE LOWEST PRICES ON 3Com ADAPTERS:

Etherlink III

 Tokenlink III New! - PCMCIA

1-800-4-MAXNET





INVERSE MULTIPLERS **DIAL UP HIGH SPEED VIDEO/DATA USING COASTCOM'S FRACDIAL INVERSE MULTIPLEXER**

Take a look at these important features:

- Dial-up, user-selectable bandwidth on demand for up to 1.344 Mbps.
- Ideal for video, image and other data traffic.
- Serves all makes of video codec and video compression
- algorithms. **BONDING** compatible and tested by most IXC and
- RBOC labs. Drop-and-insert T1 line sharing.
- Save money by using the Virtual Bridge™ option for multi-point video conferencing.



Fracdial® is the only inverse multiplexer that works on both switched 56 kbps services and switched digital T1 voice networks. Your

PBX does the switching, saving money on every call! Many customers won't have to subscribe to or worry about availability of Switched 56! Fracdial works in more places, at a lower cost, than any other inverse mux.

With the built-in keypad and LCD display, you won't need a PC to control the Fracdial. Everything operates at the push of a button. Users can learn to make calls in less than 10 minutes.

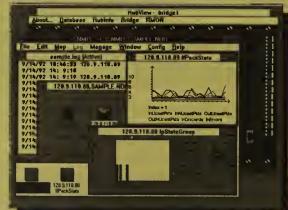
Let us show you how to SAVE on your telecommunications costs using the Fracdial. Call today at 1-800-433-3433.

Virtual Bridge is a trademark & Fracdial is a registered trademark of Digital Access Corporati

NETWORK MANAGEMENT

SNMP Management

Packed with features, and only \$495, **SNM**Pc* is the smart choice for Windows* Network Management.



Castle Rock. Computing

20863 Stevens Creek Blvd. Suite 530 Cupertino, CA 95014

Circle Reader Service No. 161

- Hierarchical Maps
- Node Discovery
- Generic Hub Display
- MIB Compiler
- MIB Table View/Edit
- Event Action Filters
- Remote Alarms
- DDE/API Interface
- Supports any TCP/IP

30 Day Guarantee, 1 Year Free Update, and much more...

Fax 408-252-2379

NETWORK MANAGEMENT HARDWARE

Presenting the world's best stackable hub. And four ways you can improve on it.

The 3Com® LinkBuilder® FMS™ 24-Port TP hub gives you 24 twisted-pair ports at a great price. How do you improve on that?



Add up to three more, for a single logical repeater



To add management, simply slide a management module into the back of one hub. Presto! The whole stack is managed.

Use 3Com's Transcend™ LinkBuilder FMS Windows Manager

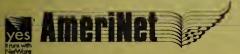


network management to anticipate and avoids problems

Add coax or fiber hubs to the stack, for unparalleled media flexibility.



Good work! You've improved on a fine product and outdone some of the competition's best engineers. Hungry for more? Give us a call for all the facts on 3Com's LinkBuilder FMS family of stackable hubs



For information call: MI (313) 995-1233 IL (708) 653-8008 • OH (216) 899-1274 CA (619) 457-0788 • PA (412) 344-7556

3-NET-3Com. Novell is a trademark of Novell Corporation. Windows is a rell makes no warranties with respect to this Product. Circle Reader Service No. 162

NETWORK MONITORING AND ANALYSIS

Nextest puts WAN Protocol Analysis in your pocket

The PocketScope is a PC-based analyzer that diagnoses protocol problems anywhere on your network. And its low cost doesn't require deep pockets.

- Designed for notebook PCs
- 64 Kbps protocol analysis
- In-depth SNA and X.25 plain English decodes
- Detailed statistics and BERT

A Multi-Interface PocketScope and a complete family of PC-based WAN analysis tools for Frame Relay, ISDN, and SS7 are also available.



Call (800) 888-0180, or (708) 574-3300 for a 15-DAY FREE TRIAL.



Nextest

NETWORK MONITORING ADAPTERS

Multi-Port RMON LAN Monitor

Ethernet and Token Ring Compatible with:

- HP OpenView
- POLYCENTER Net/View
- IBM Net/View
- SunNet Manager



3-port unit delivered within 48 hours!



1-800-659-6975

Copyright © 1994 Technically Elite Concepts, Inc. All trademarks are the property of their respective owners. Circle Reader Service No. 164

SEMINARS



SEMINARS Presents 2 Consecutive 1-Day Seminars

Netware 4.x Strategic Migration

Doing Business on the Internet

Information Technology on the Information Superhighway

April 4/5 - San Francisco, California April 7/8 - Seattle, Washington April 11/12 - Dallas, Texas April 14/15 - Denver, Colorado April 18/19 - Atlanta, Georgia April 21/22 - Miami, Florida

REGISTER TODAY FOR THE SEMINAR NEAREST YOU! 800-643-4668

Dial our Fax-Back Line for a complete Seminar Outline. 800-756-9430 - Request Document Code #60

TRAINING

$WINDOWS\ NT$ **A Complete Perspective**

"Become an expert in just three days"

- Day 1 Windows NT Architecture and Enterprise Strategy
- Day 2 Windows NT Workstations and Workgroups
- Day 3 Windows NT Networking with Advanced Server

Los Angeles **New York** April 25-27 Boston May 9-11 Dallas May 23-25 Atlanta June 6-8 San Francisco June 20-22 July 11-13 Chicago Washington D.C. Aug. 8-10

The Fastest **Most Comprehensive** Way to Learn Windows NT and Windows NT **Advanced Server Technology**

> For more information call: 1-800-762-4702



Microsoft

Use Network World FAX-NET for brochure of course outline and registration Circle Reader Service No. 165

VIDEO CONFERENCING

Think of us as See-Mail.

Introducing the only video conferencing solution for your LAN or WAN



Now there's a new product that lets you video conference over your LAN or WAN. Directly from your PC. Just like video E-Mail. We call it InVision (but you can think of it as "See-Mail").

InVision uses your office's current LAN or WAN to make any Windows PC a full-motion,

color video conferencing center. It's easy. InVision's "point and click" toolbar with its colored drawing tools and shapes simplifies making annotations...and making your point.

For more information on InVision, call

703-506-0094. And picture a new way to conference.



InVision Systems Corporation • 8500 Leesburg Pike, Suite 300 • Vienna, Virginia 22182 • Fax 703-506-0098 • CompuServe 72002, 1677 • Internet e-mail info@invision.com Circle Reader Service No. 166

RKETPLA

The Hub of the Network Buy

Fast Info with FaxNET

Here's How it works:

- Dial **1-800-664-8271** on your touch tone phone.
- Wait for the prompt and follow instructions.
- Key in advertisers' 5 Digit Number.
- Information requested will be faxed to you immediately.

CYBEX CORP	30210
NETLINK INC	30070
NETVANTAGE	30030
NETWORK APPLICATION TECH	30160
WANDEL & GOLTERMANN	30090
WESTERN MULTIPLEX	30230

There is no cost to you to receive information on these network products and services!

N.A.T.'s Multiprotocol Router now only \$1,495

Expands TCP/IP and Novell® NetWare® networks to multiple remote locations

Simple to install and operate **Remote console and TELNET support SNMP** agent **Bridging capability via PPP** Supports NetWare 3.1x and 4.x



Communications Week bridge/router rating

N.A.T. LANB/280 Bridge/IP Router	7,0
Vitalink/NSC 6602 bridge-router	69
3Com NetBuilder II bridge-router	66
Newbridge Ethernet Little Bridge	66
Proteon CNX 500 Bridging Router	57
Xyplex 3210 local bridge-router	54
Weilfleet Link Nobe bridge-router	47
ACC AC5 4200 bridge-router	43
Microcom MBR 6000 bridge-router	35



call 1-800-474-7888

for a reseller nearest you, or to order immediately

Money order, purchase order, VISA, MasterCard, American Express.

For additional information on N.A.T.'s complete product line call our FAX Hotline at 1-800-776-8448





Novell, NetWare, the Yes logo and the NetWare logotype are trademarks of Novell,

If you've been holding your breath for an economical ATM capable ethernet switch, you can start breathing.



Introducing the NV7500.

- End User Price of \$400.00/Port!
- SNMP managed ethernet LAN switching in groups of 8 ports in single or shared LAN mode.
- Full wire speed in full bridging mode at any frame size with single frame latency.
- Please call for OEM pricing!

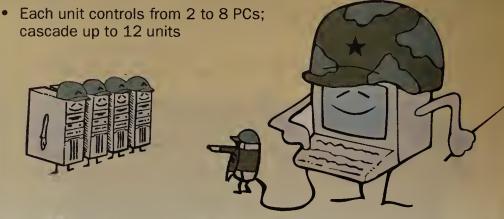
1800 Stewart Street, Suite R
Santa Monica, CA 90404-4967 USA
Tel 310 828-9898 Fax 310 828-2553

AutoBoot Commander

Control up to 96 file servers with just 1 keyboard, monitor and mouse!

- Supports all 100% IBM compatible computers
- AutoBoot™ feature boots computers without operator intervention
- New KeyScan™ feature for keyboard-controlled scanning
- Jumperless support for analog (VGA) and TTL video
- Add a second control center up to 150 feet away

cascade up to 12 units



For Macintosh support, ask about our new Mediator™ for Macintosh!

Cybex Corporation 4912 Research Drive . Huntsville, AL 35805 USA (205) 430-4000 • FAX (205) 430-4030



IBM is a registered trademark of IBM Corporation. Macintosh is a registered trademark of Apple Computer, Inc **Dealer Program Available**



Introducing the LYNX.

A uniquely flexible spread spectrum radio. Not just for data, but voice and video too.

LYNX puts you in control-not the phone company.

Now you can interconnect remote locations yourself, free from the monthly charges, lower reliability and bureaucratic delays of telco leased lines. Simple and straightforward, LYNX configures in minutes, runs virtually maintenance-free, and pays for itself in a matter of months.

- Voice, data, and video (with appropriate external equipment)
- ATM, Frame Relay, ISDN
- LAN/MAN/WAN interconnect
- Full T1 bandwidth (1.544 Mbps.)
- Point-to-point, line of sight up to 40 miles
- No FCC licence required (unlike conventional microwave)
- 99.99% reliability-compared to 95% (typical) for telco leased lines

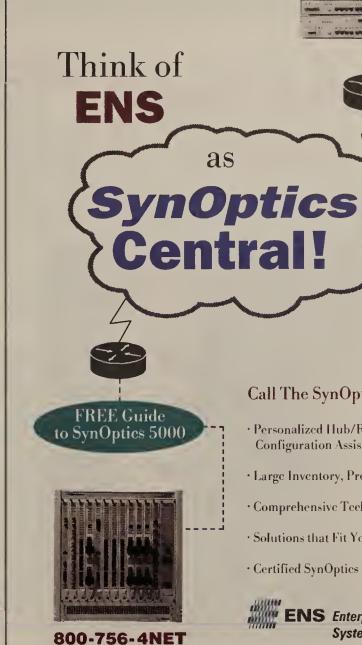
Call us today for application assistance and more details.



Designing and manufacturing quality communications equipment since 1979

415-592-8832

300 Harbor Blvd., Belmont, CA 94002 • Fax (415) 592-4249



Call The SynOptics Specialists

- · Personalized Hub/Router Configuration Assistance
- · Large Inventory, Prompt Delivery
- · Comprehensive Technical Support
- · Solutions that Fit Your Budget
- · Certified SynOptics Engineers



ENS Enterprise Networking Systems, Inc.

Get readyhere comes DISASTER

Surviving a Telecom Disaster

A CCMI Conference • May 23-24, 1994 • St. Louis, Missouri

- How to prepare -and sell a disaster recovery plan
- · How carriers react in disasters 3 weak spots to watch for
- The Texas Instruments Earthquake Survival Manual
- Floods, earthquakes, fires, terrorists, hurricanes: stories from the front
- · What local telcos can do for you
- · Long distance recovery options: how much redundancy is there - really? Tough questions to ask your carrier
- Do disaster recover services work?

SPEAKERS INCLUDE: Leo WROBEL, Premiere Network Services • Ben TAYLOR, Texas Instruments • Dennis McINTYRE, A.G. Edwards & Sons • Gail HUTCHINS • Pacific Bell • Joe WALKOVIAK, Southwestern Bell • Jon GRAINGER • Comdisco • Dave McDANIAL, BMS Catastrophe... and many other disaster planners and survivors.

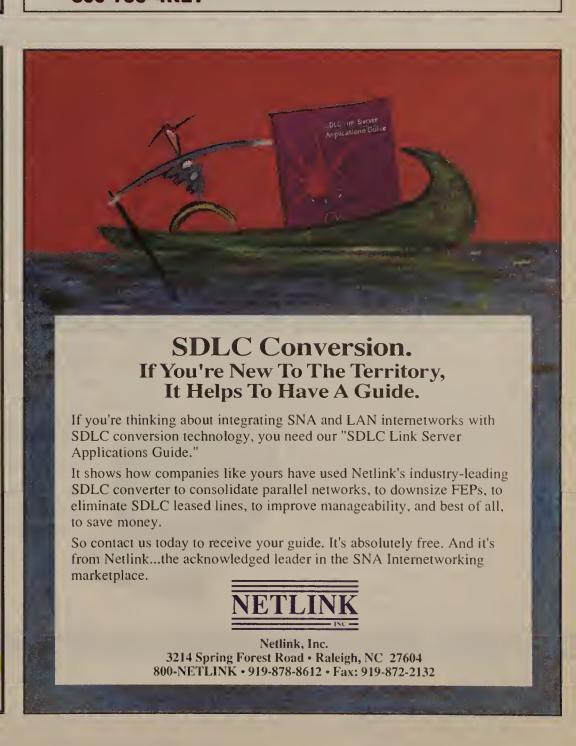


Publishers of the 411 and Telecommunications Alert newsletters, and the nation's #1 provider of telephone rates and tanffs

To register, call 1-800-929-4824

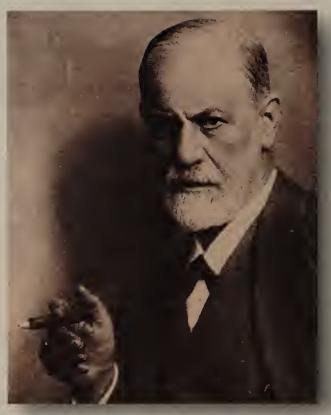
Fee: \$595

ext. 684





Dr. Sigmund Freud



Dr. Sigmund Freud

Announcing dual analysis for ATM.

The new ATM capabilities on our DA-30 Internetwork Analyzer are indispensable to anyone developing ATM internetworking solutions.

With dual simultaneous analysis in a powerful, easy-to-use Microsoft® Windows™ environment, the DA-30 provides the tools you need to perform

stress testing, traffic analysis and benchmarking across your entire internetwork. Today, DA-30 broadband capabilities support HSSI and DS3

ATM. Tomorrow, new ATM interfaces will continue the DA-30 tradition of providing flexible internetworking solutions. But then, what else would you expect

from Wandel & Goltermann, the developers of the new IDMS remote monitoring family and many other internetworking analysis tools?

For more information and the phone number of your local sales office, call us direct. Because when it comes to internetworking analysis, no one can provide you with better solutions than W&G.

Wandel & Goltermann
Electronic Measurement Technology





VIDEO TAPE TRAINING

- Token Ring
- Ethernet
- T1-Carrier Switched Telephone Circuits
- ISDN-BRI
- X.25 Protocol Analysis
- SDLC/SNA Protocol Analysis

Call for Demo Tape Ph: 215-598-3293 Fax: 215-598-7690

Advertise in the Marketplace and watch your sales come pouring in!



Reserve your space today!

Call Toni Clayton 800-622-1108 ext. 596

Wouldn't you prefer to have your customers looking at what you have to offer here?

Your Ad Could Be Here for \$255

Call Toni Clayton (800) 622-1108 Ext. 596

ATTN: EXPERIENCED AGENTS

CONTROL YOUR OWN DESTINY

HERTZ TECHNOLOGIES, a wholly owned subsidiary of the Hertz Corporation, is expanding its operations and is looking for highly motivated industry professionals to market our multiple carrier programs. We pay commissions on invoice, assume any bad debt, provide customized billing, and customer service.



Hertz Technologies 405-728-4179

Teletutor InfoMatrix Series Computer Based Training

"A must for anyone in the networking business."

- Introduction to LANS
- Types of LANS
- LAN Network Operating Systems
- LAN Protocols
- Linking LANS
- LAN Standards

NOW AVAILABLE - 21 DAY RENTAL \$99

USING TECHNOLOGY TO TEACH TECHNOLOGY

DEC DELQA-YM Hi-perf Ethernet Controller

DEC DELQA-M Ethernet Controller

DEC DEQNA-M Ethernet Interfoce

DEC DSRVB-AA DECServer 200/mc

HP 28685B Ethertwist Tronsceiver

Mointenance and support of H-P, Apollo, DEC and NeXT since 1978.

crisis@netcom.com

HP 28641A ThinLAN MAU

\$ 510 DEC DEBET-AA LANBridge 100

1-800-542-2242

FAX (603) 433-2260

The Answer to LAN Management

The Ultimate Network **Troubleshooting Software**

- Manages fault discovery.
- Hardware inventory database.
- Creates status reports.
- Remote alarm notification.
- Alarms via modem.
- Schedules tasks on any node esp. software audit & virus scans.

Netware 3.x and 2.x

25 User

To order call (800) Net X-555

INFOTRON EQUIPMENT

380's, 600's & 992NP Equip.

M.A.R.C. has over 3000 modules in stock to support

I/O Nest Modules, Chassis, and Whole Units.

We also stock modules for 1500, 480, 680, 792's for less

DMS ANMACS **EQUIPMENT TOO!**

> CALL M.A.R.C. (615) 822-7990

Novell NetWare® 4.01 **Liquidation Sale !!!**

We are liquidating excess NetWare® 4.01 25, 50 and 100 user versions only, at the following drastically reduced prices:

NEW 25 user CD-ROM \$1899* NEW 50 user CD-ROM \$2199* **NEW** 100 user CD-ROM \$3949*

*Free shipping / Priced to move out!!

*FREE CD-ROM Drive With Purchase

(With mention of AD when ordering / ONLY while supplies last)

All are BRAND NEW/Complete/Novell sealed packages. These are the regular RED boxed latest version Novell products, not the OEM versions-Guaranteed!

Call 1-800-998-8371 to order now **CountryWide Liquidators**

> Satisfaction Always Guaranteed! (References of our customers available)

> **Hurry!** Limited Supply!!

(Note: Please call if interested in the above sizes only)

3Com...SYNOPTICS...CABLETRON...NOVELL...SMC...PROTEON ETHERNET * TOKEN RING * FIBER

LARGEST NEW/USED 3Com INVENTORY ANYWHERE

WE ALSO BUY & SELL USED LAN EQUIPMENT - CALL FOR PRICES

800-AKA-3COM (800-252-3266)

CARLETRON	GENERIC ETHERNET				
PTMTM-01\$1150	2 PORT REPEATER\$370				
RMTM-24A\$1150	4 PORT REPEATER\$530				
IT800\$300 U	8 PORT 10-BT HUB\$245				
IMAC-3\$400 U	12 PORT 10-BT HUB\$380				
RMF\$65	POCKET ADAPTER\$250				
NEW NETWORK ADAPTERS					

NEW NEI WORK ADAPTERS					
	3Com	SMC	INTEL	NOVELL	CLONE
8 BIT COAX	140	110	120 -	130	69
16 BIT	115	105	118	130	69
16 BIT COMBO	125	120	125	125	99
32 BIT	235	600	440	560	220
TR 16/4MB ISA	425	295	440	350	275

QUANTITY DISCOUNTS AVAILABLE

3Com	
LINKBUILDER MANAGEMENT	\$425
NETBUILDER II 8-SLOT	CALL
LINKBUILDER MSH	CALL
NETBUILDER LOCAL	\$750
NETBUILDER REMOTE	\$3400
MULTICONNECT REPEATER	\$750
MULTICONNECT THIN MODULE.	\$180
CS/2000 COMM. SERVER	\$1350 \
֡	LINKBUILDER MANAGEMENT NETBUILDER II 8-SLOT LINKBUILDER MSH NETBUILDER LOCAL NETBUILDER REMOTE MULTICONNECT REPEATER MULTICONNECT THIN MODULE.

NOVELL v3.12

of users <u>5</u> <u>10</u> <u>25</u> <u>50</u> <u>100</u> <u>250</u> \$ 585 1270 1850 2475 3475 6375

When you call,

ı	SMC	•	3812TP 3812SNMP.	\$590
L	SMC		3812SNMP.	\$590
L	SYN	-	2800A	\$690
п	SYN	-	2803	\$775
L	CNET		8000TP	
ı			PROTEON	
L	1392		**************	\$275 U
ы.	1200			#07E

3Com - 3C1627-1.

1392	\$275 U		
1390	\$275 U		
1890	\$250		
7102	\$600 U		
2710	\$250 U		
SYNOPTICS			

ш	SYNOP	TICS	
Ц	3514ST-02	\$2500	
п	3000-01		U
1	3030-01		U
П	2715-04		
u	2310-02		
и	208-ST		
ı	3512	\$3200	

SAVE 50% & MORE ON MOST PRODUCTS

BUY/SELL/NEW/USED

Reconditioned With Warranty

800.726.0726 SALES 800.729.0739 SERVICE CORPORATION 408.270.1183 FAX

CRISIS

CRISIS COMPUTER

Modems · Multiplexers · T-1 · CSU/DSU's · Channel Banks ·

Newbridge Channel Banks	\$399
AT&T CSU/DSU NEW!	
T-1 CSU's	\$49
CSU/DSU 56KBPS, V.35	
Telco Systems Channel Banks.	
Wescom Channel Banks	
Datatel DSU/CSU 56KBPS	
Vitalink Transian III Bridges	
Stat Muxes 4, 8, 16, 32, port	

METROCOM

ALL MFG'S AND MODELS AVAILABLE

(800) 364-8838 or (713) 783-8838 FAX (713) 783-8832 24 HRS

these product lines, including:

Power Supplies, Modems,

than 50% of the original cost.

tell them you saw their ad in the Marketplace!

ROUTERS **BUY / SELL / REPAIR**

WSA ERGONOMIC INC. 47 WERMAN CT., PLAINVIEW, NY 11803 516-293-5200 FAX: 516-293-5325

CISCO WELLFLEET IBM 3COM CABLETRON SYNOPTICS PROTEON

COMSTAR Buys, Sells and Repairs NETWORK Equipment. Bridges • Routers • Hubs NIC's • 5250/3270 • Emulation • MAU's/CAU's/LAM's

COMSTAR, INC. The #1 NETWORK Remarketer 612-835-5502

FAX: 612-835-1927 5250 W. 74th St., Minneapolis, MN 55439

Free Seminar on **CD-ROM** and Multimedia Publishing

Call 1-800-229-2222 to attend a remarkable half-day seminar that gives you a closer look at real world applications, benefits, costs and shows you how to evaluate and get started in this exciting technology.

Now you can get an inside look at the latest in CD-ROM and multimedia publishing.

The seminar is sponsored by Dataware Technologies, the world leader in CD-ROM software and services, and Emerging Technology Applications, the CD-ROM publishing unit of IDG, the world leader in providing information on information technology.

Sponsors also include Sony Electronics, Inc., demonstrating their portable Multimedia CD-ROM Player and desktop CD-ROM drives; Adobe Systems, Inc., introducing Adobe Acrobat to CD-ROM publishers; Microboards, Inc. showing the new PlayWrite 1000 CD-Recordable system; and TDK, a leading manufacturer of CD-Recordable media.

Look at real world applications You'll see exactly how leading companies are using these technologies today. And gain a better understanding of how your company can profit from them.

You'll learn how to get started; the

title development process; how to choose software and hardware, and benefit from the experience of other companies who are already using CD-ROM and multimedia as a competitive advantage.

Look at new technologies

You'll discover new ways to work with CD-ROM. Like cross-platform publishing which allows you to distribute one disc that runs on DOS, Windows, Macintosh and UNIX; CD-Recordable which enables you to create a CD-ROM disc at your desk; portable multimedia players, and more.

Look at interactive demonstrations You'll see detailed demonstrations and view popular CD-ROM applications on multiple platforms, as well as through Adobe Acrobat.

Look at all you get

You'll take home a free copy of Computerworld on CD, with unlimited access to the most recent six months of news and editorial from Computerworld, the weekly newspaper for Information Systems.

And the Guide to CD-Recordable Applications, a 24-page industry report which shows you how CD-ROM and CD-Recordable can benefit your company, how to estimate costs, application development, hardware selection and much more.

Look at your schedule

The seminars are absolutely free. Simply call Dataware Technologies at 1-800-229-2222 and ask for the seminar registration desk. Or, check the seminar you wish to attend on the form below and fax it to 1-617-494-0740.

FREE! Computerworld on CD



Now get a chance to sample the power of CD-ROM with unlimited access to the most recent six months of news and

editorial from Computerworld, the weekly newspaper for Information Systems. Computerworld on CD is a comprehensive source of news, graphics, vendor and product information, key surveys, the Consultants Directory, the Premier 100 and more. With fully indexed text for over 25,000 articles from Computerworld, you'll have quick access to the world of IS.

Six months of information is yours free when you attend any of the CD-ROM and Multimedia seminars.

Seminar Reservation Form

ı	Location	Date	Location	Date	
ı	☐ Cleveland	May 3	☐ Brunswick, NJ	May 18	
ı	☐ Cincinnati	May 4	☐ Dallas	May 19	
ı	☐ Atlanta	May 5	☐ Philadelphia	May 19	
l	☐ Scottsdale, AZ	May 10	☐ Los Angeles (LAX	May 24	
ı	☐ Memphis	May 10	☐ Calgary	May 24	
l	☐ Ottawa	May 10	St. Louis	May 25	Na
l	☐ Portland, OR	May 11	☐ Sunnyvale, CA	May 25	
ı	☐ New Orleans	May 11	☐ Vancouver	May 26	Co:
ı	☐ Toronto	May 11	☐ Chicago	May 26	κ ۸
l	☐ West Palm Beach	May 12	☐ Baltimore	May 26	Ad
ĺ	☐ Montreal	May 12	☐ Mpls./St. Paul	May 27	Cit
	☐ Seattle	May 13	☐ Boston	June 1	Cit
	☐ New York City	May 17	☐ Long Island	June 2	Pho
	☐ Washington, DC	May 18	☐ New Haven, CT	June 3	
	· ·	,			

Yes, please reserve a place for me at the seminar I have checked. No, I cannot attend the seminar, but I am interested. Please have a representative call me.

me______Title _____

State Zip Fax _____

NETWORK WORLD





COMPUTERWORLD

PlayWrite1000

FAX this Seminar Reservation Form to 1-617-494-0740



All brands and product names, trademark or registered trademarks are the properties of their respective companies.

INFORMATION DATA PRODUCTS CORP.

DSU / CSU'S **MODEMS MULTIPLEXERS**

NEW/REFURB BUY/SELL/TRADE-IN

AT&T CODEX DCA **IBM**

N. E. T. **PARADYNE MILGO UDS**

MORE!! MICOM

800-362-3770

3780 BSC 3770 SNA

AIX **OS/2** DOS

- Easy to install and use
- ☑ Menu-driven configuration
- Unattended operation
- ✓ Powerful script language
- Auto-dial and auto-answer Optional programming API

Serengeti Systems Call Today! 800/634-3122

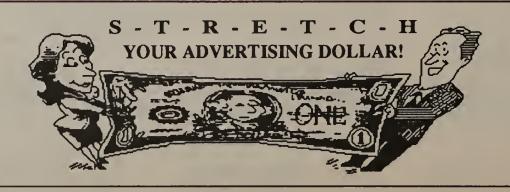
SDLC, LAPB, PPP, BISYNC, ASYNC

LINK PROTOCOL API

- Platforms: UNIX, DOS, OS/2 Multi Port Intelligent Card
- Speed up to 56kbits/sec
- Leased/dialup line
 - (V.32, V.25bis)
- TLI/XTI Interface on UNIX Menu Driven Configuration
- Similiar Interface on DOS, OS/2 User Configurable Link Protocol
- Also available: X.25 DTE, ASYNC PAD **SNA 3270, LUO, APPC**

Digital Technology (617) 229-9797

Get the most out of your money by advertising to a highly qualified & targeted circulation!



Network World helps your Marketing Dollars go farther!

> Call Toni Clayton 800-622-1108 ext. 596

Networking Careers

Toin responsible for the design, manufacture and support of products and systems that provide interconnectivity solutions to local, national and global network users. Recently, our company began implementing an exciting new channel strategy and are looking for self-starting individuals with enthusiasm, tenacity and business savvy as well as the ability to develop their own territory.

The Evolution

Sales Executives

Though products differ, our ideal candidates for the following sales positions will be well-polished, focused, high-energy closers committed to increasing the company's revenue and, in turn, their own.

ACCESS PRODUCTS

Atlanta, Seattle, Dallas, Detroit, Boston

This individual is primarily responsible for increasing sales revenue of Cray Access products within an assigned region, through new and existing indirect sales channels. This should be accomplished through the analysis of our present sales efforts and results as well as our competitors, and the management and fine-tuning of regional value added resellers and integrators. Qualifications include 5 years experience in selling access data communications equipment through indirect sales channels. Proven success selling to national distributors, VARs, systems integrators or state and local government is mandatory.

HOST CONNECTIVITY PRODUCTS Dallas, Washington, D.C.

Responsible for overseeing Reseller Channels in their region, analyzing current activities and initiating strategies designed to establish new sales channels for Cray's Host Connectivity products (Gateways, Terminal Servers, SNA Transport Processors, Remote PC). Requirements include six years proven experience selling to and supporting Reseller Channels, an industry background in the SNA mid-range computing environment and LAN Internetworking arena.

CARRIER SALES

Washington, D.C.

Manage inter-exchange carriers as a distinct sales channel for Cray's line of Access products. This individual will be responsible for assessing current sales penetration and creating and implementing a plan targeted towards developing each carrier as a National account, utilizing Cray's world wide sales force. Requirements include five years experience selling data communications equipment to inter-exchange carriers and two years in sales management.

COUNTRY MANAGER

Latin America

This high level position holds full responsibility for the expansion and development of business in Latin America. This individual will work with the VP of Sales to audit and analyze current regional sales activities and create and implement a strategy designed to achieve increased activity within new and existing sales channels. The duties of this position require a results-oriented individual with considerable knowledge of the Latin American market. Professional experience should be in data communications or mid-range computing with a proven track record in sales or sales management. Superior interpersonal abilities and fluency in Spanish and English are essential.

SR. SYSTEMS ENGINEER San Jose, Washington, D.C.

The incumbent will act as technical liaison between Engineering and Sales for our Host Connectivity products. Specifically, this person will provide the highest level of pre-sales support to all sales channels, assist in the sales/demonstration training of other Systems Engineers and Sales Reps and participate in trade shows for new product launches. Requirements include 5-8 years pre-sales experience, project management and multi-tasking abilities and IBM internetworking experience with host access emphasis, including Routers, Gateways, Hubs. LAN Protocol knowledge is also necessary.

SYSTEMS ENGINEERS

Dallas, Washington, D.C., Philadelphia

These individuals will provide pre-sales support to Sales Reps in their assigned regions. Specifically, they will assist Sales and Marketing with reseller training and industry trade shows, conduct product presentations and prepare technical proposals. Three to five years pre-sales and technical experience, superior project management skills and a background in diverse WAN and basic LAN internetworking are required.

TECHNICAL SALES SUPPORT SPECIALIST

In this position, the chosen individual will answer our "Fast Track" Sales Support number, responding to applications and technical questions, recommending solutions and providing Cray product literature. Calls will be initiated by National Reseller/Regional VAR channels, the Cray Marketing Department and Customer Service. Qualifications include technical competence in WAN, LAN and Telecommunications and the abilities to multi-task, work independently and operate a Macintosh.

Cray Communications is one of the world's leading voice & data communications companies,

PRODUCT MARKETING MANAGER Host Communications Products

This position calls for a visionary marketing professional to assume a pro-active marketing role for our host communications products, including Gateways, Terminal Services, SNA Transport Processors and Remote Node Access Servers. Our ideal candidate will have experience with a LAN manufacturer or reseller involving LAN internetworking of AS400 and System 36 environments. Exposure and knowledge of SNA and APPN is mandatory. Superior marketing savvy will enable this person to establish positioning for all US marketplace products as well as track and analyze competitive products. Sales channel knowledge is desired. Prior systems engineering experience is a plus. Domestic and international travel is required

SERVICE MARKETING REPRESENTATIVE

Working in our Customer Support Services area, this individual will provide sales and marketing support to include: creating/providing marketing materials for departmental use, providing pricing information and clarifying service policies.

Importantly, the ability to comprehend and interpret technical information is essential. Proven customer service skills and an understanding of marketing principles is necessary. Additionally, this individual must be able to promote excellent relations with clients, consultants and internally.

FIELD ENGINEER

San Jose

The Field Engineer is responsible for on-site customer maintenance calls and installations. Importantly, this person will represent our Company in a professional, business-like manner, promoting customer satisfaction and, in turn, repeat sales. Requirements include superior analytical and problem-solving skills along with a thorough understanding of data communications equipment, including: modulation techniques, diagnostic and configuration of Modems, Multiplexers, CSUs, DSUs, T1 Digital Switches, LANs, WANs, Packet Switches, Protocol Emulators and Network Management Systems.

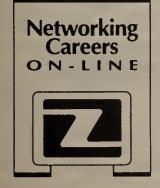
Our company provides a competitive salary complemented by extensive benefits. For consideration, please send a resume and cover letter specifying position of interest and salary requirements to: CRAY COMMUNICATIONS, Human Resources, 9020 Junction Drive, Annapolis Junction, MD 20701.

See us at INTEROP, Booth 3519!



Communications

EOE M/F/D/V



Networking Careers On-Line gives networking and communications job seekers a new way to learn more about career opportunities advertised in Network World. This free service, available through Network World's On-Line Bulletin Board System, was designed to provide you with the information you need to keep abreast of current opportunities and make informed career decisions. You'll see the text of an entire month's worth of Networking Careers employment opportunities as well as valuable additional background information on the advertising companies. Networking Careers On-Line can be accessed 24-hours a day on the Network World Bulletin Board System (BBS). Call today!

NETWORKING CAREERS ON-LINE

508-620-1160 [300-2400 Baud (8-N-1)], 508-620-1178 [up to 9600 Baud (8-N-1)]

Networking Careers

GIE. We are the Future.

With global vision and world-class resources, GTE offers talented professionals the opportunity to connect with an inspiring future. We currently have outstanding career opportunities available for the following positions in our Ontario, Thousand Oaks and Norwalk offices.

BUSINESS ACCOUNT MANAGER

- BS degree or equivalent work experience
- Direct knowledge with territory management and forecasting disciplines
- Conceptual knowledge of Voice/Data and Network technologies
- Strong business acumen with the ability to relate complex technologies to customer business applications
- Knowledge of financial justification methods

STAFF SALES ENGINEER -NETWORK APPLICATIONS

- · BS degree required; degree in CS, EE, BBA or Math preferred
- Minimum 8-10 years experience in network applications incorporating ISDN, DCS, AIN, SCAI, MMDS, SMDS, CentraNets, DS-1, DS-3, E911 or ATM
- Minimum 3 years successful account management/consultative selling experience involving complex network designs
- Capable of understanding customer business applications

ACCOUNT MANAGER -BUSINESS DATA NETWORK

- Minimum 2-3 years consultative selling experience exceeding quota in the data environment selling to Fortune 2000 companies
- Conceptual knowledge of LANWAN technology (emphasis on WAN) to enhance credibility with Data decision makers
- Excellent business acumen with the ability to relate complex LANWAN technology to customer business applications
- Proficient at developing financial justifications including cost, financial benefit, and payback

STAFF SALES ENGINEER-DATA APPLICATIONS

- BS degree or equivalent work experience; degree in CS, EE or Math preferred
- Minimum 5-8 years computer applications, LANWAN, or data communications experience
- 2 years experience as a "sales engineer" in the data industry
- Ability to clearly articulate highly technical concepts to a variety of audiences
- Job history/experience in 3270 data communications environment with good understanding of communications enabling software such as VTAM is highly recommended

GTE offers competitive benefit and compensation programs. For confidential consideration please fax or send your resume to: GTE Telephone Operations, Management Staffing, One GTE Place, CA 500HS, Thousand Oaks, CA 91362. FAX (805) 494-3867. Or join us at Networld/Interop Trade Show, Las Vegas, May 4-6. Principals only please. Equal Opportunity Employer M/F/D/V.



SEEK CONSULTING GROUP, INC.

ontractors!

WE'RE IN YOUR FUTURE'S MARKET

- ▲ UNIX Internals (HP-UX, Soleris) ▲ UNIX, SCSI, OS/2 device driver
- ▲ SNMP, CMIP implementation
- ▲ FDDI, Ethernet, Freme Relay
- ▲ Video Teleconferencing, Voice, Data
- ▲ UNIX, Networking
- ▲ HP OpenView, Network Mgmt. ▲ DEC networking, TCP/IP, VMS
- ▲ Novell ODI drivers, NDIS drivers, **Network drivers**
- ▲ ATM developers ▲ Novell, NLM, APPC, SAA

Opportunities available throughout the U.S.

Learn more about SEEK, contracting opportunities, marketplace info, shareware and games by calling our Electronic BBS at 617-246-8243.



Contract rates up to \$85/hour!

Please send or fax your resume to our Corporate headquarters at: 401 Edgewater Place, Suite #430, Wakefield, MA 01880; Attn: Dept. Network Div.; Fax: 617-246-8246; Phone: 1-800-274-1174; Internet: jobs@seekcon.win.net.

and extensive database enables us to successfully locate and place virtually any type of network software and hardware professional on a contract basis. Our goal is to provide a unique resource that allows our contractors to meet their professional objectives and our clients to meet their business goals.

At Seek Consulting

Group, Inc. our national presence

And You Thought That Entrepreneurs **Only Worked Out Of Garages.**

The entrepreneurial spirit is here, at SynOptics. We're developing a unique culture within a corporate environment that gives our staff members the power and freedom to take charge of their work, to see it through from concept to market. If you have the entrepreneurial spirit, SynOptics is your place. Consider the following:

SynOptics is leading the way providing the enterprise-wide networks of today and the multi-enterprise networks of tomorrow — generating a host of opportunities in the following disciplines:

- InternetworkingATM/Switching
- Network Management
- Ethernet and Token Ring Connectivity

We are interested in initiating a dialogue with leading industry candidates for current and future job openings. We hope you take advantage of this opportunity to get to know some of our people and the potential of a career at SynOptics.

Product Managers

SynOptics is always looking for talented Product Managers who are as professionally evolved as our products. Leaders who know what's in the future for LAN/WAN technologies & how to create an advantage in a competitive market.

Software Engineers

Design DOS and UNIX-based network management products. Skills in the software arena should include: C, C++, GUI, X-window, Motif, TCP/IP, Hub, Internetworking, embedded systems, and device drivers.

Hardware Engineers

ASIC Design - Relevant LAN industry experience including ASIC design with Verilog HDL or Synopsys VHDL required.

Board Level Hardware Design - of microprocessor based

Firmware Engineers - Agent software/firmware experience is necessary to develop device drivers.

Must possess a strong track record selling networking products, growing existing accounts, developing new accounts, preparing marketing plans and activity/forecast reports.

Customer Engineers

Our field sales offices and Technical Response Center employ pre and post sales Engineers with a strong work ing knowledge of bridges, gateways, & routers to provide technical support, conduct technical presentations and enhance network configurations. Experience with Ethernet, Token Ring, TCP/IP, and UNIX is highly desirable. Familiarity with OSI module is necessary.

SynOptics' Technical Center **Meeting Room N110** (within the convention

Wednesday and Thursday, May 4 - 5, 10am - 6pm

Friday, May 6, 10am - 4pm

center)



ists for you.

Stop by during Interop and discuss our unique and challenging environment and the potential that ex-

If you are unable to stop by our Career Hospitality Suite, mail or FAX your resume to: HR-Dept. NW-loP, SynOptics Communications, Inc., P.O. Box 58185, Santa Clara, CA 95052-8185. FAX: (408)764-1899. Internet address-careers@pobox.synoptics.com EOE M/F/D/V



The Network Fabric of Computing

UPCOMING EDITORIAL

BONUS SHOW DISTRIBUTION

Issue	Editorial Feature	Close
5/9	Client Server Test Lotus Notes	4/27
5/16	Buyers' Guide: T1/T3 & Fractional Services	5/4
5/23	Buyers' Gulde: Relational DBMS	5/11

5/23 - BONUS DISTRIBUTION AT:

Windows World/Comdex Spring- Atlanta DB EXPO - San Francisco ICA - DALLAS, TX.

CALL PAM VALENTINAS

1-800-622-1108

To place ad or for information

CONSULTING

Contract Solutions is affering long-term consulting opportunities throughout the United States. Most positions pay between \$80,000-\$130,000 per year.

NETWORK DESIGN

- **◆ SNMP** ◆ X.400/X.500
- **◆ ATM ◆ BRIDGES/ROUTERS** ◆ NIS
- **◆** ETHERNET ◆ TCP/IP **◆ SNA ♦ X.25**
- ◆ UDP/IDP **◆ SOCKETS/STREAMS**

NETWORK/SYSTEMS ADMINISTRATION

◆ WINDOWS NT NOVELL ◆ SOLARIS **BANYAH** ◆ 0SF/1 ◆ PATHWORKS **MS WINDOWS**

◆ APPLETALK ◆ VMS **SOFTWARE ENGINEERS**

UNIX KERNAL ◆ C++,000 DRIVERS OSF MOTIF ◆ PORTING ◆ SOLARIS, C

◆ ORACLE ◆ PROGRESS ◆ ACCESS **◆ SYBASE**

Contract SOLUTIONS

Salem, NH 03079-4875

◆ TCP/IP

603-893-6776 Fac: 603-893-4208 800-998-CSi 1 (2741)

· UNIX

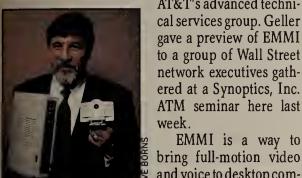
AT&T to roll out desktop video product

BY KEVIN FOGARTY

AT&T is set to introduce a device that will let workstations support voice, video and data links over 155M bit/sec Asynchronous Transfer Mode (ATM) links.

The Enhanced Multimedia Interface (EMMI) is a workstation adjunct that includes a camera perched on top of the workstation monitor. Working with microphones and speakers built into the workstation, the device lets users see and hear others while running applications and sharing data.

AT&T will announce the product at next week's NetWorld + Interop 94 show in Las Vegas, said Mike Geller, new business development manager for AT&T's advanced techni-



gave a preview of EMMI to a group of Wall Street network executives gathered at a Synoptics, Inc. ATM seminar here last week.

EMMI is a way to bring full-motion video and voice to desktop computers without making the central processing unit do all the work,

Geller said. "Now you don't have to use the phone to make a call, use your computer to see data and use a TV to see video," Geller said.

The device uses a Windows-based front-end control and a standard Small Computer System Interface connection to personal computers and workstations.

"You don't have to buy new workstations," Geller said. "This works with what you have."

EMMI connects to an ATM network via a Synchronous Optical Network OC-3 fiber-optic transmitter/receiver. It outputs video in National Television Standard Code standard format and can take feeds from videocassette recorders, video cameras or appli-

cations running on networked PCs. It supports audio from a compact disc player, microphone or VCR.

Geller predicts EMMI will be popular with Wall Street and for uses such as interactive retail kiosks.

EMMI will not be generally released until the third quarter of this year, but units are available for user evaluation at \$7,500 apiece, which includes the desktop camera. That price will probably come down when the unit is produced in volume, Geller said.

Most who saw the product demo were enthusiastic. Angela Jakobs, assistant vice president at Bank Julius Baer, a New York stock trading firm with headquarters in Zurich, said adding videoconferencing to desktops on the trading floor would be a huge benefit.

Others were interested, but not ready to jump in to anything. "This is the first implementation of something that's going to be more developed later," said Henry Mazaheri, assistant vice president of Sumitome Bank. "Now it's \$7,500, but in a year or 18 months, it'll be \$1,000, or \$1,500."

Lionel Wong, systems manager for investment firm Jais USA, Inc. in Jersey City, N.J., whose network runs entirely on copper wire, is disappointed that EMMI comes only with fiber-optic cable connections. "We would have to re-cable the whole thing. That would be very expensive," Wong said.

OAT&T: (910) 279-7829.

Arcada to put forward backup software for Windows NT nets

Product to give administrators central control.

"Centralized

management of

anything always

sounds like a

good idea if

you're running

multiple

servers," Oliver

Bailey said.

BY CHRISTINE BURNS

Lake Mary, Fla.

Arcada Software, Inc. this week will deliver new software designed to let network administrators centrally manage data backup across networks based on Windows NT Advanced Server systems.

Storage Exec will let systems administrators configure, monitor and control local and remote data storage on Windows NT-based nets from a central console. The offering will work with either Windows NT's backup utility or Arcada's Backup Exec software, both of which can reside on Windows NT servers and clients.

Mary Fenton-Lee, product manager for machine running Windows NT, Storage Exec

Storage Exec at Arcada here, said the company is aggressively pursuing after the Windows NT backup market, while most other enterprise backup product vendors are focusing on Novell, Inc. NetWare localarea networks. Arcada has a close relationship with Microsoft Corp., having worked with the company since 1992 when they began development of the built-in Windows NT backup

Not to be left out of the Novell market, however, Arcada plans to add Net Ware support to Storage Exec by year end, Fenton-Lee said.

While users appreciate new network management tools, the true benefits of a centralized storage management product are questionable to some.

"Centralized management of anything always sounds like a good idea if you're running multiple servers," said Oliver Bailey,

president of OHB Software, Inc., a Rolling Meadows, Ill., software development firm that uses the Windows NT backup utility to protect data on its network. "But I questioned its worth for backup because you're still going to have to walk around and change the tapes."

changes— throughout their networks may be more likely to use a product like Storage Exec, however, he said.

lets an administrator partition the enterprise into an unlimited number of backup domains and define backup policies for each.

Storage Exec polls all available tape servers and devices within the backup domain, allowing them to be used on a first-come, first-serve basis. The tape drives can run concurrently, maximizing data throughput in an allotted time. If a tape drive within a domain

should fail, the aborted backup job is submitted to the next available device.

Using the reporting and loadbalancing utilities of Storage Exec, the administrator can monitor performance in each backup domain and improve performance by balancing the data load.

For disaster recovery protection, Storage Exec has an elec-

Large companies that can afford to put high-capacity storage devices — which require less frequent tape

From an Intel Corp. 486 or Pentium

NETWORK WORLD

license for Backup Exec clients. ©Arcada: (800) 327-2232.

In store from Arcada Storage Exec will let net administrators:

Configure backup domains by assigning server

Centrally schedule, monitor and control backup

Balance backup jobs among distributed tape

running concurrent jobs on devices within a

Schedule backup jobs to an off-site tape server

tronic vaulting feature that creates off-site,

permanent backups on a tape server in a

tained on a central catalog server, making it easy to search for and retrieve files. Once an

administrator has selected a file to be

restored, a fast file access function allows

Storage Exec to search for the file on the tape

device at speeds up to 200 times faster than

be priced according to the number of tape

tape device license, costs \$2,385. Storage

Exec will be shipped with an unlimited

Storage Exec will be available by May and

The first module, which includes a three-

Information about stored files is main-

Reduce the time to complete backups by

Generate customized reports of enterprise

and tape devices to each.

and restore functions.

single backup domain.

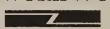
for disaster recovery.

secure storage facility.

its typical search rate.

devices it monitors.

backup activity.



161 Worcester Road Framingham, Mass. 01701-9172 (508) 875-6400

Second-class postage paid at Framingbam, Mass., and additional mailing offices. Network World (USPS 735-730) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World, Inc., 161 Worcester Road, Framing-

To apply for a free subscription, complete and sign the qualification card în this issue or write Network World at the address below. No subscriptions accepted witbout complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-508-820-7444.

Non-qualified subscribers: \$5.00 a copy; U.S. — \$95 a year; Canada — \$117.70 (including 7% GST, GST #126659952); Central & South America - \$110 a year; Europe - \$165 a year, all other countries - \$245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label from front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor,

Network World is distributed free of charge in the U.S. to qualified management or professionals who meet ALL of the following criteria: Have site purchasing influence.

2) Are involved in the purchase of network products and services.
3) Have multi-platform networks installed or planned (including net-

work architectures, LAN operating systems and LAN environments).

PHOTOCOPY RIGHTS: Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by Network World, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus 50 cents per page is paid to Copyright Clearance Center, 27 Congress Street, Salem, Mass. 01970.

POSTMASTER: Send Change of Address to Network World, P.O. Box 3090, Northbrook, 1L 60065

Copyright 1991 by Network World, Inc. All rights reserved. Reproduction of material appearing in Network World is forbidden without written permission.





Reprints (minimum 500 copies) and permission to reprint may be purcbased from Reprint Services, 315 5tb Ave. N.W., St. Paul, MN 55112

ISSN number: 0887-7661.

IBM, DEC expand EDI offerings

BY ADAM GAFFIN

Anaheim, Calif.

Both IBM and Digital Equipment Corp. last week demonstrated 1988 X.400-based electronic data interchange software that offers enhanced features at reduced prices.

The products were shown at the Electronic Messaging Association's Electronic Messaging '94 show

Digital's DEC/EDI 2.0 server software, set to ship in May, will now come in OSF/1 and OpenVMS versions for Digital's Alpha AXP — it previously ran only on Digital VAX sys-

tems. The product includes a SQLbased client for Windows platforms that lets users see the status of EDI transactions. The offering is based on Digital's ObjectBroker object technology for connecting applications across a heterogeneous network.

When connected to Digital's Mail-Bus electronic mail server, DEC/EDI can be used for messaging via X.435,

the EDI-over-X.400 specification.

Pricing ranges from \$9,000 to \$30,000 for the Alpha version. Digital also cut its pricing for the VAX version to that level; the VAX version previously cost between \$10,000 and \$87,000.

IBM's RISC System/6000-based OSI Services/6000 product, which was

> previously announced, is an X.400 server in itself. But the company announced a deal with Isocor of Los Angeles to integrate the server with Isocor's Isotrade EDI server, allowing the IBM system to support X.435 messaging.

IBM had previously offered only a mainframe-based X.400 server.

Pricing for IBM's RS/6000-based X.400 offering depends on configuration but ranges between \$2,500 and \$15,000. That's far less than what IBM charged for its MVS-based X.400 software, the company said.

ODigital: (800) 332-4636; IBM: (919) 254-5074.

Groups forge plan to give SMDS a ride on ATM nets

BY JOANIE WEXLER

Foster City, Calif.

In what could be a coup for broadband interoperability, two industry groups last week shook hands on a plan for running Switched Multimegabit Data Service traffic over Asynchronous Transfer Mode networks.

The SMDS Interest Group and ATM Forum agreed on a way to map SMDS' packet format to ATM Class D connectionless service specifications.

Depending on carrier acceptance, the move could give metropolitan pockets of SMDS "an interexchange bus to ride that makes more sense than [lower speed] frame relay," said Daniel Briere, president of TeleChoice, Inc., a consulting firm in Verona, N.J.

While SMDS has drawn a limited following to date, users who have committed to it, such as 3M Corp., are clamoring for interexchange links (see story, page 31). Interexchange SMDS service is only available in limited areas today from MCI Communications Corp.

If adopted, the spec would enable other carriers to tote SMDS traffic from one island to another without offering native SMDS services.

The agreement could also be a boon to non-SMDS users seeking on-demand broadband connections. The spec would allow carriers without SMDS transport platforms to offer high-speed dial-up services without having to provision ATM switched virtual circuits (SVC), which are still a ways off, said Robbie Forkish, president of consultancy RFPC, Inc. in Eugene, Ore.

Today, the ATM User-to-Network

Interface — the link from a customer's premises to a carrier's ATM network only supports connection-oriented, cell-based services. This requires users to provision links to other network nodes ahead of time.

In networks that support the newly stamped spec, users could run connectionless (LAN-like) broadcast traffic over that interface in addition to T-1 circuit emulation, constant bit-rate data and ATM virtual channels.

AT&T, Sprint Corp. and WilTel all said they are evaluating connectionless services over ATM, but have not yet committed to SMDS as their service of

If implemented, there could be a technical benefit to the SMDS-over-ATM scheme because ATM SVC performance has yet to be determined.

''If the setup time is in milliseconds, ATM SVCs would be comparable with SMDS. However, if ATM SVCs take seconds, there could be a true performance benefit for short-session, transaction-oriented applications using SMDS over ATM," Forkish said.

Some early SMDS experiences indicate otherwise. David Bittenbender, telecommunications branch chief at the U.S. Environmental Protection Agency, said his organization tested 4M bit/sec SMDS for a LAN interconnect application.

"We found that the switching delay on setup meant it didn't offer any performance improvement over a straight T-1 line," he said. "I'm not sure anyone would suspect ATM setup time would

NetWare

Continued from page 1

networking, even within the 3.X environment," said Linda Brown, local-area network administrator at Hewitt Associates LLC, an AuditWare beta site based in Lincolnshire, Ill.

"This gives me a complete profile — all the data I need — without having to deal with each server separately," said Brown, whose network encompasses more than 50 file servers from coast to coast.

AuditWare gives administrators information about the logical network makeup, including which users have access to which resources on which servers.

Used with the company's Origen net management tool, AuditWare also lets users centrally modify access rights for NetWare 2.X, 3.X and 4.X servers.

The product runs on a nondedicated workstation anywhere within the NetWare environment, according to Jack Serfass, president of PSI, based here.

With a click on an icon, the administrator can have AuditView take a snapshot of all bindery and object information for one or all servers on the network. AuditView downloads that information to any networked database the administrator specifies.

Users can then run a number of reports based on any aspect of the bindery information. For example, administrators can highlight a resource and generate a report about all users that have access to it, or find all users configured for a particular security level. Because that database does not reside on the server,

running reports does not affect server performance.

"With the product we're using now, [LAN Support Group's BindView, the software takes live information from the server and compiles a report right there," Brown said. "But if the report doesn't produce the expected result, you have to give the software different parameters and it compiles another report at the server using live information.

"I find Audit Ware much more appealing because I can get the information once and create as many reports on that data as I want and manipulate data any

way I need to," she added.

Jamie Lewis, vice president at The Burton Group, a research and consulting firm in Salt Lake City, agreed. "If I need to audit your network usage for chargeback reasons, with BindView, for example, I would need to compile a report for each server you have access to then go through each of those reports individually for the information I need."

PSI expects to bring out a version of the AuditWare for the IBM Application System/400 by the third quarter that will give administrators audit data for users that have access rights to both AS/400s and NetWare servers. By the end of the year, PSI plans to integrate the product into various higher level net management products, such as Novell, Inc.'s NetWare Management System and Hewlett-Packard Co.'s OpenView.

AuditWare is available now at \$595 per server. PSI is also offering a competitive upgrade to BindView and Blue Lance Software, Inc.'s LT Auditor users for \$129 per server through June 30.

©PSI: (800) 222-7638.

Bank

Continued from page 1

traders of the securities — that the fund's portfolio and cash position has been updated.

In development since 1991, the new Global Horizon Interchange network is credited with helping State Street win contracts to service some of the world's largest investment pools, such as the \$70 billion California Public Employees Retirement System.

Typically in the banking industry, "general query work doesn't do well against production databases geared to transaction processing," said David Sexton, State Street's executive vice president and director of information technology.

As a result, the regulatory requirement that mutual funds price their assets daily to provide investors with a net asset value has typically fallen to the custodian the institution that actually holds the securities.

"Some people would sav we're more of a software house than a bank."

-David Sexton State Street Bank &

But using Global Horizons Interchange, "you can use shrinkwrapped software" to access real-time data at State Street, Sexton said.

Under Global Horizon Interchange, the bank runs a proprietary on-line transaction processing (OLTP) database on a Systems Network Architecture-based IBM mainframe taking in live data on the purchase of

stocks and bonds. The OLTP system contains software agents that then forward any information of interest to particular clients by using mailboxes on the mainframe that contain the customers' Internet Protocol addresses.

After that, an RS/6000-based gateway running IBM's SNA Services software converts the data from SNA to IP. Then the data is sent to an SQL database either at the bank or on a customer's local-area

The bank is linked to its customers via dedicated internet circuits and Cisco Systems, Inc. routers —

The numbers on State Street Bank

Assets under custody: \$1.6 trillion Estimated amount of money moved on a typical business day: \$100 billion

> Number of mutual funds serviced: 2,209

Typical revenue margin of assets under custody: 0.049%

Estimated number of data center and technology employees: 1,700

Estimated annual technology spending: \$116 million

devices that the bank itself has had installed at its customers' sites.

Customers can access the SQL-based data locally if the bank has sent the information to a database at the customer site or via the internetwork if the customer chooses to have the bank house its SQL database.

Global Horizons Interchange is not available to all of State Street's customers. Rather, it is a value-added service now used with about five or six major clients, with a total of about 100 workstations attached to the internetwork, Sexton said.

"Right now we're treating it as a high-end prod-

But anyone on a fund's LAN — from cash managers to accountants to stock traders — can use desktop database products, such as those from Oracle Corp. and Sybase, Inc., to initiate database queries. Spreadsheet software — including products from Microsoft Corp. and Lotus Development Corp. — can also access realtime data from State Street.

Bank analysts said a system like State Street's has been a long time coming and took courage to implement, despite the potential payback. Andy Wasser, research analyst with The Tower Group, a consultancy in Wellesley, Mass., cited one bank that had to write off \$50 million to \$60 million after failing in a similar project when some transactions started going

With trust clients, in general, you have to be super careful about doing anything to disturb them," he

Comments?

See "Contacts" box on page 2.

War

Continued from page 4

new tools for managing directories.

The cc:Mail Router Version 5.2 lets administrators schedule routing of messages, based on factors such as time, size of messages and even recipi-

Similar capabilities were added for distribution of directory updates, as well as a feature that lets managers limit what directory information is forwarded to specific domains within a cc:Mail network.

The directory functions are an update of the company's Automatic Directory Exchange software, which has been folded into the Router software.

Andy Watts, director of cc:Mail product development, said this function would help companies integrate their messaging networks for electronic commerce while shielding potentially sensitive directory information.

The new version, to ship by June, is likely the last major version to be released before the company rolls out its Lotus Communications Server for providing enterprise messaging early next year, officials said. Pricing was not announced.

HPENHANCEMENTS

Meanwhile, HP announced support for Lotus Notes and the remote versions of cc:Mail, Microsoft Mail and 1988 X.400 in its OpenMail X.400 server, as well as the ability to distribute Open-Mail bulletin board conferences across a network of servers.

OpenMail could already be used as a message store-and-forward system for cc:Mail local network clients. HP said such abilities mean it can be used today as the type of server Microsoft is only promising.

David Ferris, president of Ferris Networks, a San Francisco-based Email consultancy, said the basic concepts of Touchdown and Explorer are good ones that will help network managers and end users. The question, he said, is whether Microsoft will be able to deliver all of the pieces as scheduled.

''It could easily be another LAN Manager, another Windows," he said. "It could take six years to develop. In contrast, HP is already shipping its server, while Lotus has developed a powerful technology for managing

UB switch

Continued from page 1

Karp, president of the Affinity Research Corp. consultancy in Greenwich, Conn. "It needs to recapture mind-share, and rolling out a hot technology at aggressive prices will help do that."

The switch is expected to cost less than \$2,000 per port, making it cheaper than products from Fore Systems, Inc. and Syn-Optics Communications, Inc. (see graphic).

Switch wars

UB's Wizard switch will be price-competitive with devices from Fore and SynOptics, two of the leading ATM vendors.

Per-port price
Less than \$2,000
\$2,250
\$1,997-\$2,871*

Pricing for LattisCell does not include call setup or management software.

Fore currently has 500 ForeRunner ASX-100 switches installed, and SynOptics has some 200 LattisCell devices in place.

To complete Wizard's reach to the desktop, UB will provide ATM adapters supporting a variety of high-end bus types for workstations from Sun Microsystems, Inc. and Hewlett-Packard Co. Whether UB develops the cards on its own or signs an OEM deal has not yet been decided.

Pricing for the cards has not been determined, but UB is under pressure to price them aggressively. Fore made news this

> week with the first fiber-based ATM adapter for less than \$1,000 when it cut the cost of its SBA-100 ATM Adapter to \$995 from \$2,495. Other Fore adapters cost up to \$2,995. SynOptics currently sells one multimode fiber card for \$1,795.

> On the enterprise side, UB will work with LightStream Corp. to ensure interoperability between Wizard and LightStream's 2010 enterprise backbone switch. Light

Stream is a joint venture formed last year by UB and Bolt Beranek and Newman, Inc. (BBN) to develop ATM products. Surprisingly, the Wizard switch is not based on LightStream technology - UB developed the switch on its own.

UB first began talking about an integrated switch module for the Access/One and a line of ATM adapter cards two years ago, reiterating that commitment when it began working on ATM development with BBN early last year.

Analysts briefed by UB were generally positive about the strategy because it lets users build on their Access/One hubs. "The UBapproach is a good one because it doesn't require a forklift upgrade," Karp said.

Competitors seemed unfazed. "We're happy to see the market expand because that will help ATM," said Joseph Skorupa, Fore's director of ATM switch marketing "With over a dozen adapter cards for several hardware platforms, we're not threatened by a firm coming up with a couple of cards."

The Wizard switch and adapter cards will be available by year end. ■

AS/400

Continued from page 1

Role reversal

IBM faces an uphill

AS/400 as a server.

Almost 60% of the

mid-range platform

for that role in the

future, according

Research, Inc. in

Cambridge, Mass.

largest U.S. firms

say they will not

consider the

to Forrester

battle trying to

reposition the

IBM did not comment specifically on its NetWorld + Interop event but described it as the largest AS/400 rollout since the machine's 1988 introduction. The firm said the announcements involve "the reengineering of the line as the industry knows it today."

"This is a totally different animal," said Ken Sobel-Feldman, president of the Sage Associates consultancy in Stamford, Conn. "Its improved network

capabilities will make it a much more attractive server and player in distributed enterprises."

Among the bigger moves, IBM is expected to roll out a new OS/400 operating system with a built-in Transmission Control Protocol/Internet Protocol stack. That will not only save users from buying a TCP/IP, but also promises to improve TCP/IP throughput up to eightfold.

The AS/400 is also likely to get Simple Net-

The

announcements

involve "the

reengineering

of the AS/400

line as the

industry knows

it today."

work Management Protocol agent support in the next year or so. That will let users monitor the AS/400 via managers such as IBM's NetView/6000 or Hewlett-Packard Co.'s OpenView.

That was good news for AS/400 user Mt. Holyoke College in South Hadley, Mass. "As we expand our network, improved performance and manageability will become requirements," said Michael Crowley, director of networking and technology services.

IBM will also offer an add-on board, with an Intel Corp. 80486 processor running IBM's LAN Manager software, that will enable the AS/400 to act as a file server for LAN-attached devices, said Mark Peterson, director of research for the D.H. Andrews Group consulting firm in Cheshire, Conn.

Also, the AS/400 will ship with IBM's AnyNet software, a form of middleware that lets an application run over any communications protocol. The firm will

add AnyNet to its PC Support program, a package that lets personal computers talk to AS/400s. PC Support will be rewritten to use less memory — an often-cited bugaboo.

"We have DEC's Pathworks, and when we run that plus PC Support, we can't run any applications," Crowley said.

PC Support will be available in individual operating system versions, including DOS, Windows and OS/2 versions. "In the past, users got one big package that supported everything," Peterson said.

Analysts said AnyNet will open up a world of new options because users will be able to run the AS/400's large applications suite — over 20,000 offerings — in a wider array of net environments. Like its AnyNet OS/2 and AnyNet/MVS brethren, AnyNet/400 will support Advanced Program-to-Program Communications over TCP/IP or TCP/IP Sockets over Systems Network Architecture protocols.

New smaller, but more powerful AS/400 models will also be rolled out at the show. These boxes, known as the Century Series, will be about one-third the size of existing AS/400s and support RISC-based add-on boards that provide increased throughput and support for Unix applications. Next year, IBM is expected to ship PowerPC-based AS/400s, which will move it squarely into the RISC and Unix market.

©IBM: (914) 642-5358.

Security

Continued from page 1

Internet in the middle is vulnerable to hackers," said Bob Frank, electronic commerce project manager at the Lawrence Livermore National Laboratory, a participant in CommerceNet, a government-vendor effort to develop an on-line mall.

The Internet's open nature makes it attractive to hackers. In recent months, the Computer Emergency Response Team (CERT) has noted attacks on Internet sites in which thousands of users may have had passwords collected and decrypted.

Microsoft Corp. Chairman Bill Gates voiced concerns about security last week in a speech at the Electronic Messaging Association conference in Anaheim, Calif. Gates said Microsoft is committed to giving customers ways to do business over the Internet but added that fire walls — technology that

keeps intruders from jumping from the Internet into a private net — will play a key role in the company's strategy.

Among the fire wall approaches firms have adopted: routers that can be set to reject Internet messages from specific addresses and software that moves all incoming messages to a holding area where they can be examined before being let through.

Ryan said that if Playboy sets up a World-Wide Web server, it would be on a standalone machine not physically connected to the company's networks. The server would be updated over dial-up lines.

Vendors also worry about protecting the privacy and ensuring the accuracy of credit card transactions. Ryan said the "sniffer" software cited in CERT reports could be used to capture credit card information, and that poses a threat to vendors, which do not want fraudulent orders, and to customers, who don't want unexplained charges on their credit card bills.

Microsoft, Lotus eye Internet tools

Microsoft Corp. and Lotus Development Corp. last week offered a peek at their plans to link their future messaging platforms to the Internet.

Officials from both companles said the work would go beyond offering electronic mail gateways between their proprietary E-mail applications and the world's largest computer network.

Tom Evslin, general manager of Microsoft's workgroup division, sald the company will look at creating application development tools for the World-Wide Web, a series of linked information servers on the Internet that is fast becoming a way for companies to market products over the net-

"We're certainly looking at all kinds of technology" that would

let companies develop Internetaccessible applications that include a strong fire wall to protect a company's internal resources, Evslin said.

> Microsoft Chairman Bill Gates demonstrated Microsoft World-Wide Web server during a keynote speech at the conference, but he used a public-domain Mosaic client developed by the National Center for

Supercomputing Applications at the University of Illinois.

Cliff Conneighton, director of marketing for Lotus' communications division, said Lotus had been looking at ways to extend the Internet to users of Lotus products. Gates' comments will likely spur Lotus to devote more attention to development of Internet applications, he said.

BY ADAM GAFFIN

Companies already on-line often require customers to set up accounts by phone or mail before they order something across the network. Even if their electronic mail orders are intercepted, credit card data is safe.

For example, the Internet Bookstore has an 800 number to let people set up accounts. Once they do that, they can then order books from an on-line catalog simply by providing their account number in an E-mail message, said President Bernie Probiac.

But that added security can limit spur-ofthe-moment sales from browsers. Duffy Mazan, a partner at Electric Press, Inc. of Reston, Va., and Jon Zeef, president of Branch Information Services in Ann Arbor, Mich., said fears of hackers grabbing credit card numbers may be overrated. Both have set up systems in which Internet users can order items through E-mail or on-line forms in a World-Wide Web client.

Still, Mazan said clients generally call first-time customers to check that their information is valid, just as many pizza parlors check on phone orders.

But Craig Schiller, a senior scientist at Science Applications International Corp. who oversees security at the Johnson Space Center in Houston, does not trust the Internet for sending credit card information.

"The number of people who have access to that credit card number is orders of magnitude different than the number of folks who have access to your [credit card] carbon in the garbage can," Schiller said.

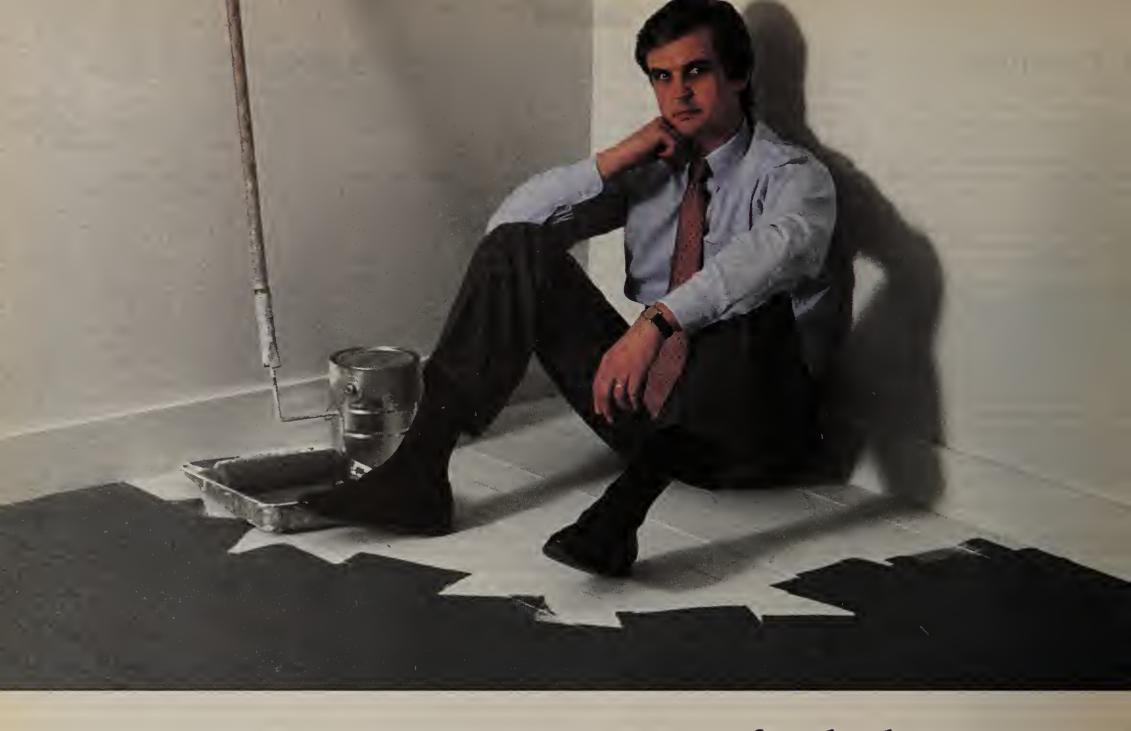
CommerceNet has a more secure approach. It has taken the Mosaic program, a graphical World-Wide Web client, and built in support for RSA Data Security, Inc.'s public-key encryption. Protecting an order form from prying eyes will be as simple as clicking on a button to encrypt the form.

But more can be done, Schiller said. The International System Security Association, a group of computer security experts, is working on guidelines for high-grade transaction security for the Internet and other networks developed under the Clinton administration's proposed National Information Infrastructure. ≥

Comments?

See "Contacts" box on page 2.

NETWORK WORLD APRIL 25, 1994 67



A great many DEC users feel this way.

TCP/IP is

the industry

standard.

It's time to

switch now.

"OpenVMS version 6.1, expected out next spring, will be the last release to include DECnet Phase IV...DEC users have their backs against the wall"

> - Network World Dec. 20, 1993.

Now is the time to decide whether to continue a proprietary network strategy or switch to TCP/IP.

TCP/IP is the industry standard for universal connectivity. It brings your VAX and Alpha AXP systems into the corporate network of mainframes, UNIX computers, LANs, and PCs. Best of all, TCP/IP doesn't require costly changes to network design, routers, or gateways.

Switch to TCP/IP with MultiNet® from TGV. MultiNet has the highest performance, most applications, better security, and the industry's best customer support. **Digital News & Review** calls MultiNet a "must for sites running VMS...the manual was excellent and the software remarkably easy to install and set up."

Don't stay painted in a corner.

Call TGV today for your no-risk

30-day free trial offer.

1-800-TGV-3440



The TCP/IP Connectivity Company

NETWORK WORLD'S

MANAGING ENTERPRISE NETWORKS

If you have state of the art management tools, shouldn't you be exhibiting, too?

Call your exhibit sales manager at (508) 470-3870!

> A Survivor's Guide to **Network and Systems** Management

Boston • July 27-29, 1994

Product Showcase

At the conference product showcase you can gather immense product knowledge that would otherwise take months to research. This is our chance to network and see live product demonstrations of the latest technologies available today!

Participating exhibitors include:

Accugraph

ALLINK

Boole & Babbage

IBM

Network Mgmt.

Forum, Inc. **Network General**

Objective Systems

Integrators

Racal-Datacom

SSDS

SunConnect

SynOptics

Communications

Ungermann Bass

Conference Co-Sponsors

Leading Network Management Product Developers

Accugraph Corporation

Accugraph's Facility and Physical Network Management automates management tasks (asset, space, cable layout, circuit design, network MAC's) and capacity planning. Accugraph's seamless integration with logical network management applications such as Hewlett-Packard OpenView, IBM NetView 6000, SunNet Manager, combines with trouble ticket applications like Remedy's Action Request for comprehensive network management.

ALLINK provides enterprise network management solutions and integration services, worldwide. ALLINK markets and develops the ALLINK* Operations Coordinator, an open, standards-based system that uses artificial intelligence to monitor network status, consolidate information, diagnose and correct problems in multi-vendor voice and data communications networks.

Boole & Babbage

Boole & Babbage is the worldwide leader in enterprise automation software for distributed systems. The COMMAND/POST production uct family is a powerful, enterprisewide management and automation system for complex multivendor environments. UNIXbased COMMAND/POST establishes a single-point of analysis and control over any management platform, any client/server architecture, or any network device, from any vendor, regardless of its conformance to standards.

IBM Enterprise Management provides a comprehensive suite of products to allow your business to effectively manage its networks. IBM's products are designed for MVS/390, AS/400, AIX and OS/2 platforms and allow network management at any platform level and/or from another platform. IBM has the network management products you need today for your multi-vendor, multi-protocol environments.

Network General Corporation

Network General Corporation is a manufacturer of software-based tools and systems for managing LANs and internetworks. On exhibit is the distributed Sniffer System* (DSS) with Expert Analysis. Also on display will be the Notebook Sniffer* Analyzer.

NM Forum, an international consortium of computer and communications systems suppliers, service providers and their customers is focused exclusively on management issues. Their OMNIPoint program is a comprehensive framework for effective service management in complex multi-technology, multi-domain environments. OMNIPoint, makes it possible to offer sophistical ed service capabilities faster, with greater efficiency and with higher quality than before.

Object Systems, Inc.

NetExpert[™], OSI's premier product, is a modular software application and platform that provides a broad range of operations support systems (OSSs), including network management, data collection, trouble tracking, service management and service activation systems. Based on standards and committed to open systems, NetExpert easily manages both standard and legacy devices, providing fault, configuration and performance management for either centralized or distributed environments including ATM, Frame Relay, SMDS, AIN, PCS, Wireless, SONET, and Voice-on-Demand.

Racal-Datacom

The Racal Management System is a flexible, modular network management system that provides comprehensive, distributed LAN/WAN management to support today's distributed computing environment. The system combines the management of over 350 Racal-Datacom products, SNMP devices, and proprietary (non-SNMP) third-party products, element managers, and software (including building automation, SCADA, and CIM systems). Management System is available on both HP OpenView and IBM's

SSDS

SSDS presents ™edesc™, an integration toolkit that expands the definition of enterprise management - by tying business process and resource management functions directly into your technology infrastructure. By presenting information in the language of business, ™ provides quantitative insight into the operational efficiency of your entire organization and enhances your competitive advantage.

SunConnect

SunConnect provides system management solutions for complex, heterogeneous computer networks. SunNet Manager ™, with the largest collection of partner applications available, Cooperative Consoles $^{\text{TM}}$, and Cooperative Reporting $^{\text{TM}}$ allow system managers of large enterprises to select the solution needed for their environment. SunConnect also provides the conductivity products to integrate Sun equipment into global networks.

SynOptics Communications, Inc.

SynOptics Communications is a leading supplier of networking products and management systems to organizations worldwide. SynOptics delivers the network fabric that enables organizations to build enterprise-wide network systems today and multi-enterprise networks in the future. The network fabric is built with intelligent hubs that link all types of computers, integrate bridges, routers and switches as needed, and provide common, integrated network management. The result is an underlying, flexible structure that provides high-speed network communications. The company, founded in 1985, is headquartered in Santa Clara, CA and has more than 50 offices worldwide. SynOptics is publicly traded over the counter under the NASDAQ symbol SNPX.

Ungermann-Bass is a supplier of networking hardware and software products and provides a range of integration services including consulting, training, and technical advice to build and support networks worldwide. NetDirector, for OS/2, NetDirector for UNIX, and NetAssistant™ management products provide the basis for management solutions scalable from campus to enterprise environments.



EMail

I'm interested in Network World's Managing Enterprise Networks '94

☐ Send me more conference information! (4044) ☐ Send me more information on exhibiting!

Name. Title_

Address_ Mailstop __

City/State/Zip

Phone (_Fax (

Drop this card in the mail or fax it to (508) 470-0526!

Or Call (508) 470-3880.

CXFXXOA



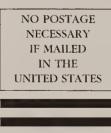


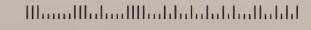
BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO.39 ANDOVER, MA

POSTAGE WILL BE PAID BY ADDRESSEE

DIGITAL CONSULTING INC. 204 ANDOVER STREET ANDOVER, MA 01810-9853







A great many DEC users feel this way.

TCP/IP is

the industry

standard.

It's time to

switch now.

"OpenVMS version 6.1, expected out next spring, will be the last release to include DECnet Phase IV...DEC users have their backs against the wall"

> - Network World Dec. 20, 1993.

Now is the time to decide whether to continue a proprietary network strategy or switch to TCP/IP.

TCP/IP is the industry standard for universal connectivity. It brings your VAX and Alpha AXP systems into the corporate network of mainframes, UNIX computers, LANs, and PCs. Best of all, TCP/IP doesn't require costly changes to network design, routers, or gateways.

Switch to TCP/IP with MultiNet® from TGV. MultiNet has the highest performance, most applications, better security, and the industry's best customer support. **Digital News & Review** calls MultiNet a "must for sites running VMS...the manual was excellent and the software remarkably easy to install and set up."

Don't stay painted in a corner.

Call TGV today for your no-risk

30-day free trial offer.

1-800-TGV-3440



The TCP/IP Connectivity Company

NETWORK VVORLD

MANAGING ENTERPRISE NETWORKS

A SURVIVOR'S GUIDE TO NETWORK AND SYSTEMS MANAGEMENT

BOSTON JULY 27-29

This Conference Gives You Solutions to Your Internetworking, Client/Server and LAN Management Challenges

GET ANSWERS TO YOUR CRUCIAL NETWORK QUESTIONS!

- What to look for and avoid in choosing an open management platform. Save hours of research time and get your project questions answered now!
- How to set up the best organizational and planning models for networked systems management. Explore real user strategies for achieving maximum benefit for your organization.
- How to manage LANs across the enterprise and what new tools are easing that task. Get an in-depth look at the key management and technology issues faced by companies today.
- How to manage your desktops and networked Unix systems. Gain specialized knowledge that will belp you build and control your distributed computing environments.

LEADING EXPERTS WHO WILL HELP YOU TAKE CONTROL...

David Passmore

Conference Chairman Consultant *Decisis, Inc.*

John Gallant

Editor in Chief Network World

David Mahler

Vice President of Marketing Remedy Corporation

PLUS:

- Management Jeopardy: Special Session
- Keynote Sessions
- Intensive Seminars!
- Panel Discussions on Critical Network/Systems Management Issues
- See Products From Over 25 Leading Tool Developers. For Exhibitor Information Call (508) 470-3870.

Call (508) 470-3880 to register or receive complete exhibitor information

Sponsored By:

NETWORK WORLD



Co-Sponsored By:













Objective Systems Integrators

RACAL

Racal-Datacom

SSDS

The Intelligent Network
Computing Company

SunConnect

Synoptics Communications

Ungermann Bass, Inc.

Learn From The Experts!

Are you responsible for building and managing the information infrastructure that will support emerging client/server and distributed applications? If so, you can't afford the to miss the only event that provides you with a survivors guide to Network and Systems Management.

Over 30 top industry leaders provide you with the first-hand solutions for critical networking issues. In-depth sessions include:

Keynote Sessions

Strategic Decisions: Choosing a Management Platform

Speaker: David Passmore/Decisis, Inc.

People and Money: Management Issues in Network Computing

Speaker: David Passmore/Decisis, Inc.

Network Management Track

Managing the Move to Advanced Data Services

Speaker: Steve Taylor/Distributed Networking Associates

Managing the Establishment Net

Speaker: Fred McClimans/Decisis, Inc.

Managing for Success – The Router-Based Internet

Speaker: John Morency/Strategic Networks Consulting

Managing Remote LAN Access

Speaker: Michael Howard/Infonetics

Managing SNA Networks

Moderator: Anura Guruge/Strategic Consultant

Capacity Planning

Speakers: Marvin Chartoff and Stu Gavurin/Ernst and Young

Networked Systems Management Track

Managing the Enterprise NOS

Speaker: Tony Croes/Currid and Company

Speaker: Managing NetWare LANs

Speaker: Mark Gibbs/Network World.

Managing Networked UNIX Systems

Speaker: Michael Goulde/Patricia Seybold Group

Managing the Desktop

Speaker: Den Edwards/Desktop Managing Task Force

Managing Security Across the Enterprise

Speaker: Mark Gibbs/Network World

Panel Discussions

Management Jeopardy: A Panel Discussion

Moderator: John Gallant/Network World

Users Speak Out on Management Concerns

Chair: David Mabler/Remedy Corporation

To offer solutions, *Network World* and DCI join forces to bring you an event focused on the management issues of building and supporting network-enabled applications in a multimedia computing environment.

Network World's Managing Enterprise Networks '94 offers a unique conference format to expand your education.

Network Management Track addresses strategic solutions and procurement strategies, staffing and operational issues, and more!

Network Systems Management Track provides you with specific knowledge of the products and services available today so you can manage your network more efficiently now!

NETWORK WORLD'S

MANAGING ENTERPRISE NETWORKS

Boston • Westin Hotel July 27-29, 1994

CALL (508) 470-3880

There's More... 🖾 See Inside Back Cover